Washington Department of FISH and WILDLIFE

2016 North of Falcon

Salmon Forecasts

2016 Forecast Meeting Schedule

9:00 – 9:30	Introduction		
	• Welcome and Introduction		John Long
	• North of Falcon – Setting Salmon Fisheries in 2015		
9:30-9:45	Habitat Presentation		Jeff Davis
9:45 – 10:45	Salmon Forecasts 2015		
	• Columbia Salmon Stocks		Ron Roler
	• Puget Sound and Coast Chinook & Coho Salmon Stocks		Aaron Dufault Aaron Dufault
	• Puget Sound Chum and Sockeye Salmon Stocks		Doug Milward
	• PFMC Salmon Technical Team Review		
10:45 - Noon	Regional Discussion Sessions		
	• Puget Sound Recreational	Room GA Aud.	Laurie, Ryan
	• Columbia River & Ocean	Room 635	Kyle(s), Doug, Wendy
	• Coastal	Room 682	Steve
	• Puget Sound Commercial	Room SLO 03	Laurie, Kirt, Kendall
Noon – 1:00 pm	Lunch Break		
1:00 – 3:00	Regional Discussion Sessions Continued		

2016 NOF Meeting Schedule

Date	Purpose	Time/Location
Feb. 24	Willapa and Grays Harbor Salmon Forecasts and Fishing	6-8pm, Montesano, Montesano City Hall
Mar. 1	Opportunities	9am-3pm, Olympia, GA Auditorium OB2
Mar. 8	Willapa Advisory Meeting	6-8pm, Raymond, Raymond High School
Mar. 9	Grays Harbor Advisory Meeting	6-8pm, Montesano, WDFW Montesano Office
March 8-14	Pacific Fishery Mngmt Council	Sacramento, Double Tree Hilton
Mar. 15	North of Falcon 1	9:30am-3pm, Olympia, GA Auditorium OB2
Mar. 17	Puget Sound Rec. Fisheries	6-9pm, Sequim, Trinity Methodist Church
Mar. 17	Columbia R./Ocean Fisheries	9am-3pm, Vancouver, The Heathman Hotel
Mar. 21	Columbia R. Fisheries	9am-5pm, Olympia, NRB 172
Mar. 22	Willapa Fisheries	6-8pm, Raymond, Raymond Elks
Mar. 22	Mid-Columbia Fisheries	6-8pm, Walla Walla, Community College, Clarkston Campus Auditorium
Mar. 23	Columbia R. Fisheries	6-8pm, Kennewick, Benton PUD Auditorium
Mar. 23	Puget Sound Commercial	10am-12pm, WDFW Millcreek Office
Mar. 24	Gray's Harbor Fisheries	6-8pm, Montesano, Montesano City Hall
Mar. 24	Mid Columbia Fisheries	6-8pm, Wenatchee, Chelan PUD
Mar. 26	Puget Sound Rec. Fisheries	10am-12pm, Mill Creek, WDFW Mill Creek Office
Mar. 30	North of Falcon 2	9:30am-5pm, Lynnwood, Lynnwood Convention Center
Apr. 6	North of Falcon - Columbia R./Ocean	9:30am-5pm, Olympia, NRB 172
Apr. 8-14	Final Pacific Fishery Mngmt Council	Vancouver, WA., Hilton Vancouver

Handouts

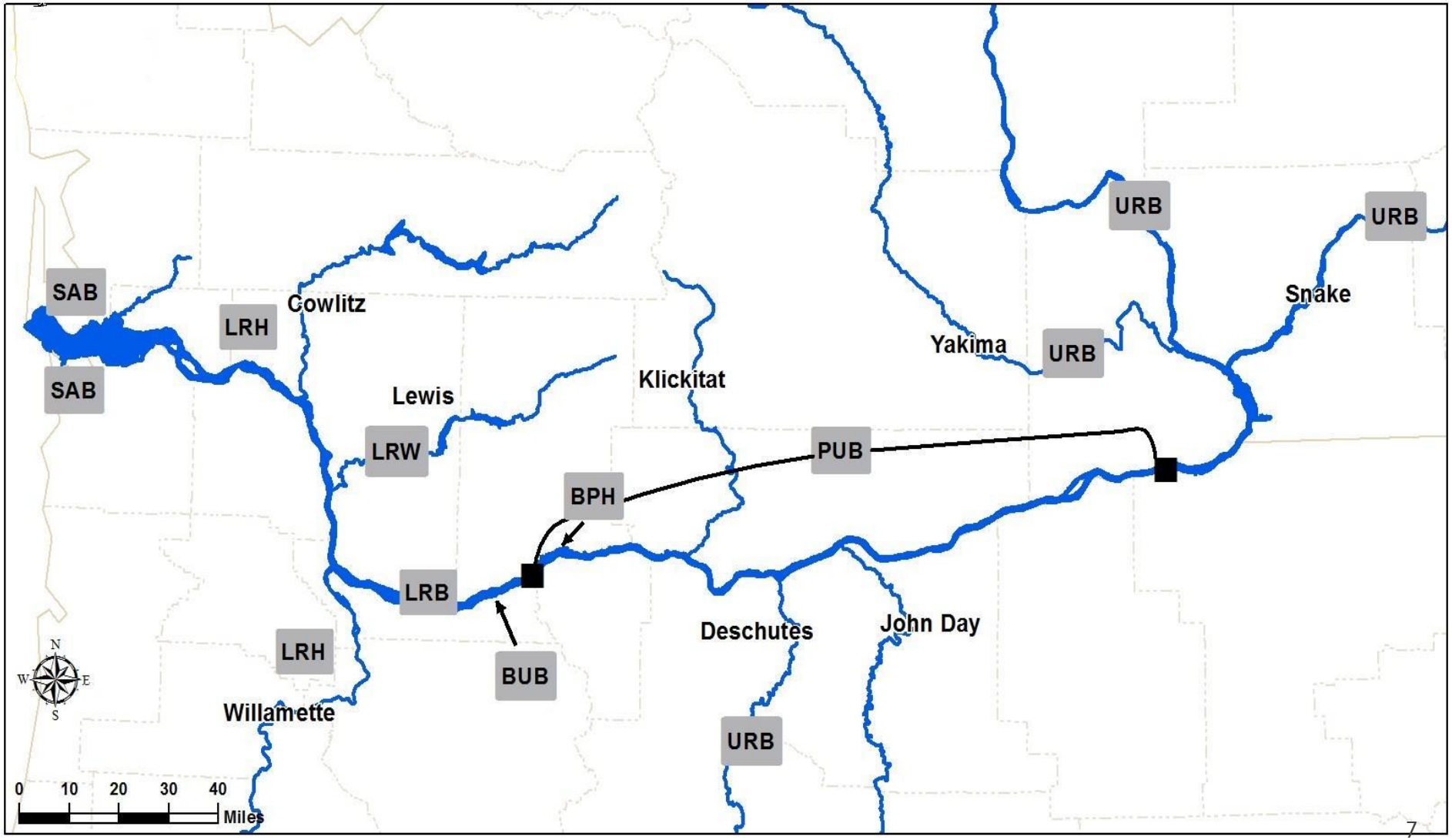
- Agenda/Schedule
- FWC Policies (NOF & Hatchery/Fishery Reform)
- PFMC Tables
- Regional Forecast Details:
  - Puget Sound Chinook
  - Puget Sound Coho
  - Puget Sound Chum & Sockeye
  - Columbia River Chinook & Coho
  - Breakout Session Handouts
- Presentation slides

2016 Columbia River Fall Chinook and Coho Forecasts

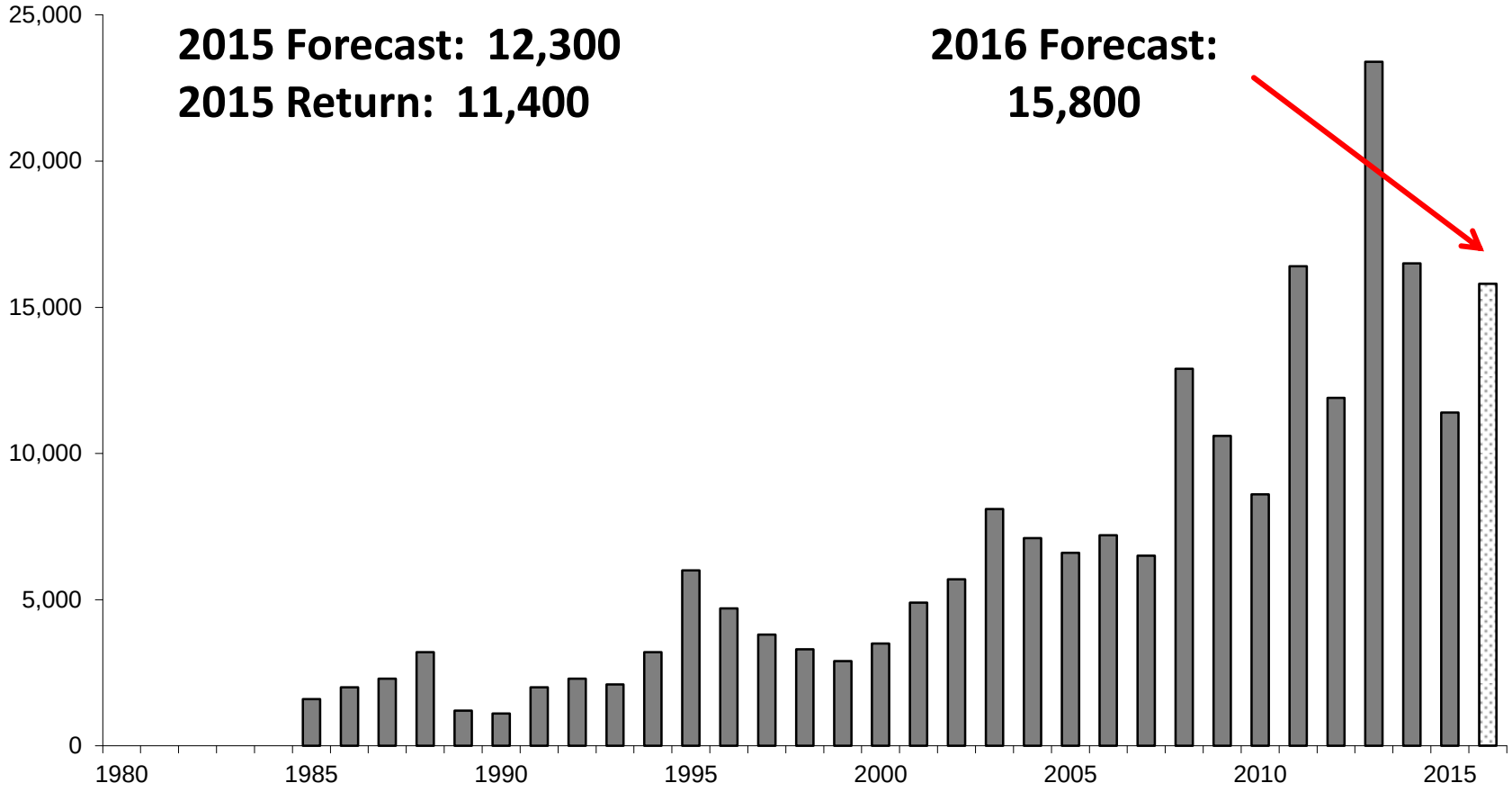
Columbia River Fall Chinook

- Six major stock groups
  - SAB – Select Area Brights
  - LRH – Lower River Hatchery (tule stock)
  - LRW – Lower River Wild
  - MCB – Mid-Columbia Brights (3 sub components)
  - BPH – Bonneville Pool Hatchery (tule stock)
  - URB – Upriver Bright
- Most constraining stock recently is LRH, which is used to represent Lower Columbia River Natural (LCR) tule stock.

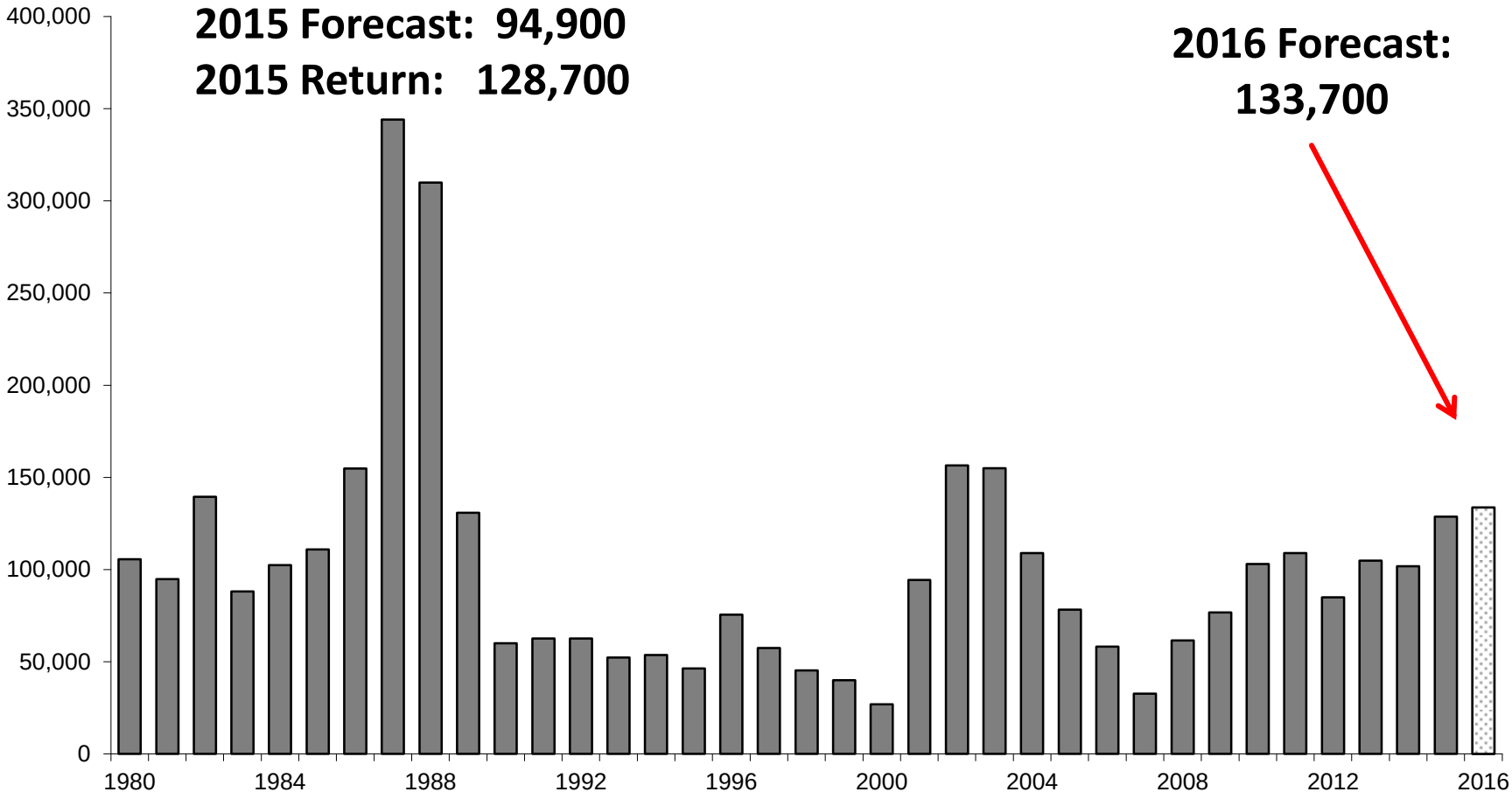
Fall Chinook Stocks and General Destination



Select Area Brights (SAB) Fall Chinook



Lower River Hatchery (LRH) Fall Chinook

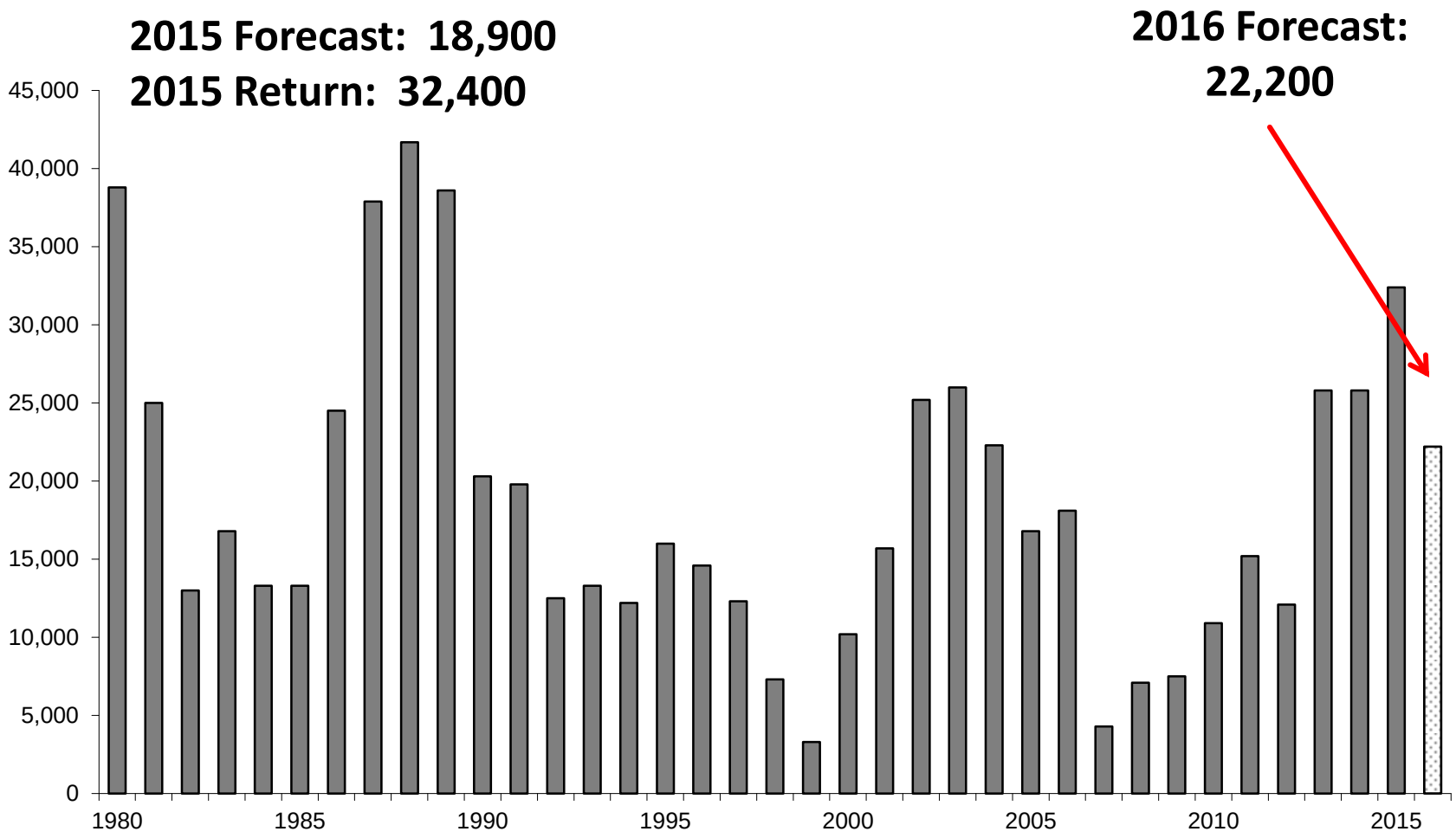


LCR Tule Exploitation Rate Matrix

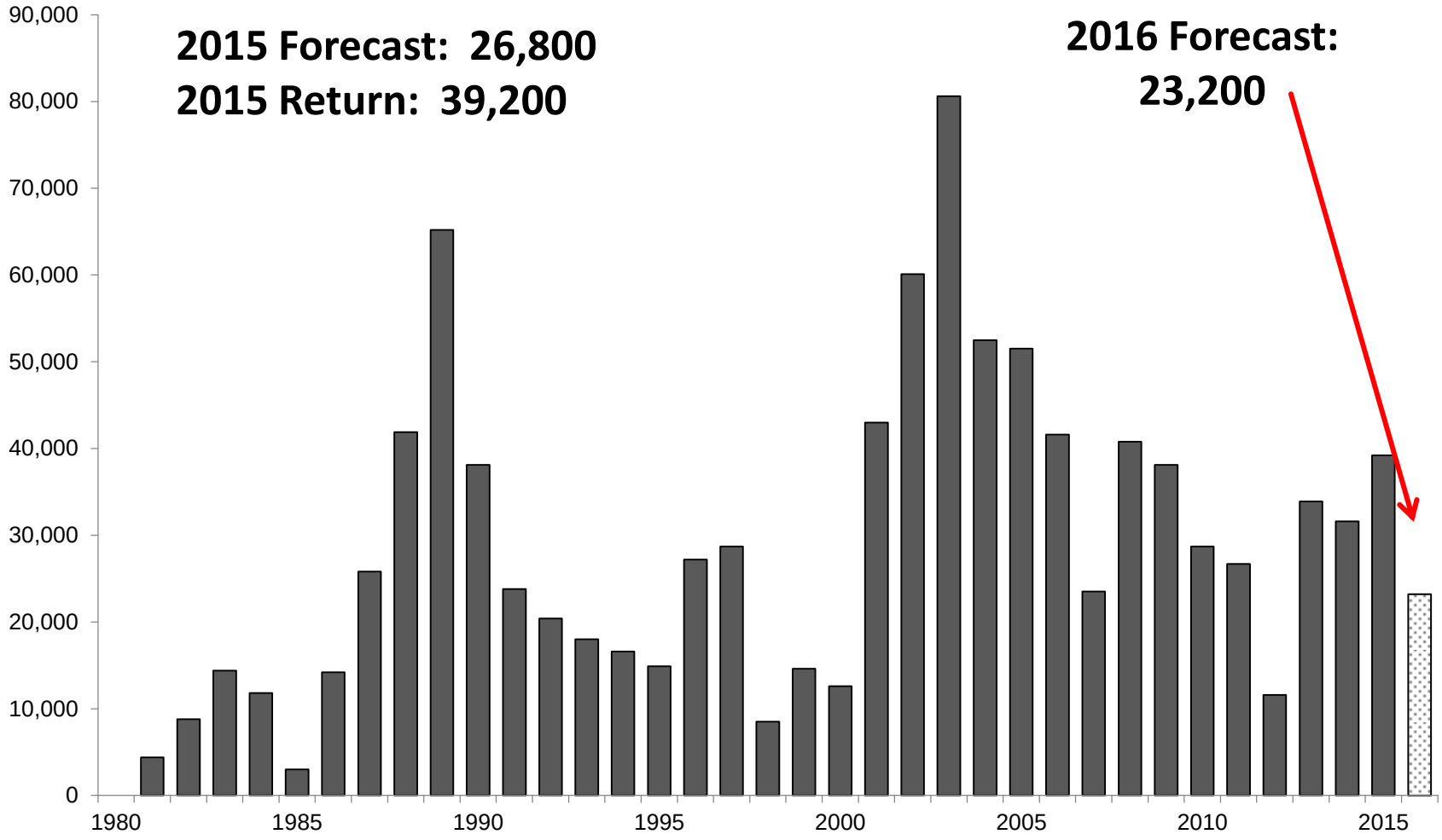
LRH Run Size	LCR Tule ER
<30,000	30%
30,000 – 40,000	35%
40,000 – 85,000	38%
>85,000	**41%**

Based on 2016 LRH forecast of 133,700 fish, ocean and in-river fisheries will be managed to not to exceed a 41% exploitation rate (ER)

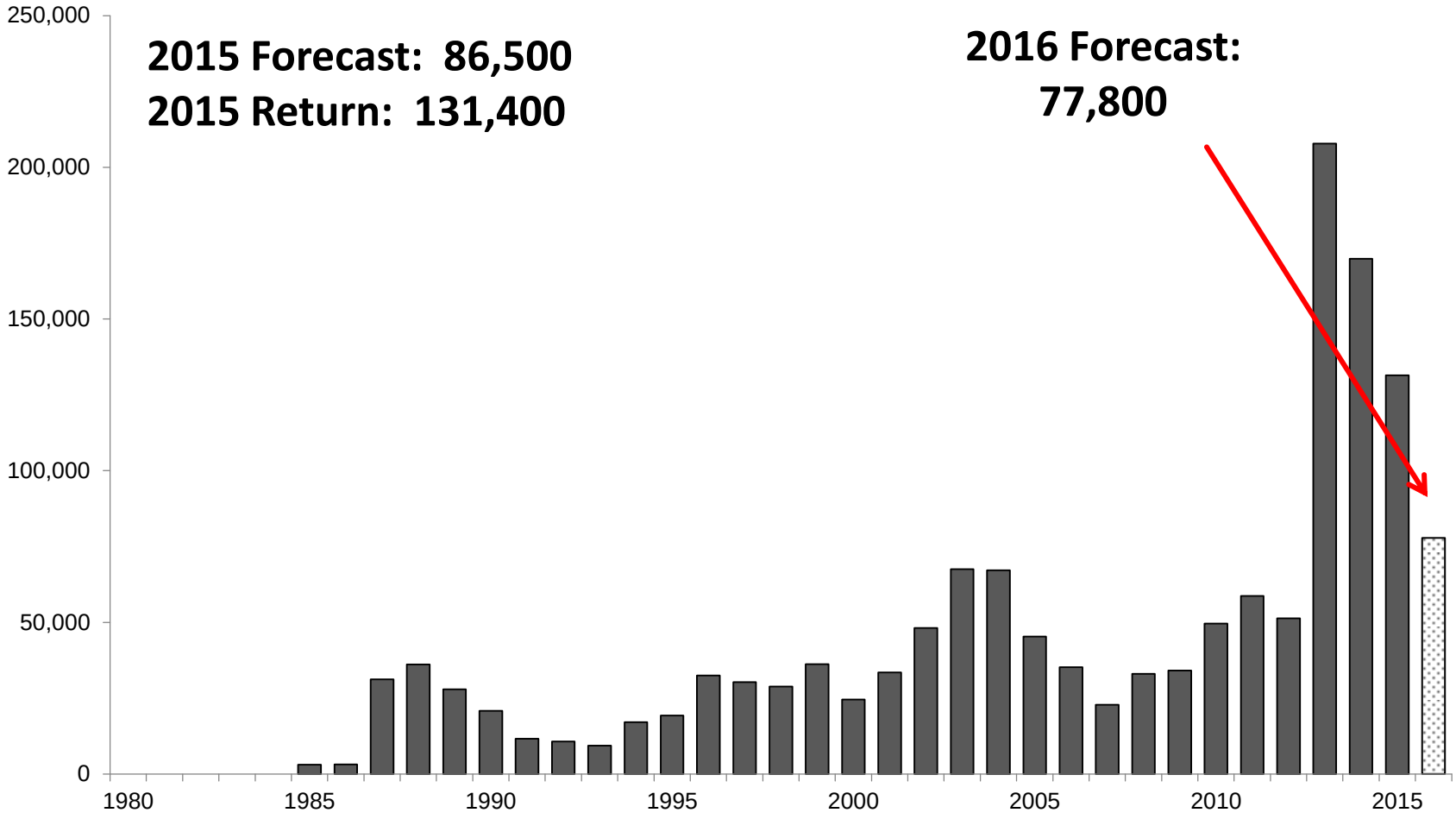
Lower River Wild (LRW) Fall Chinook



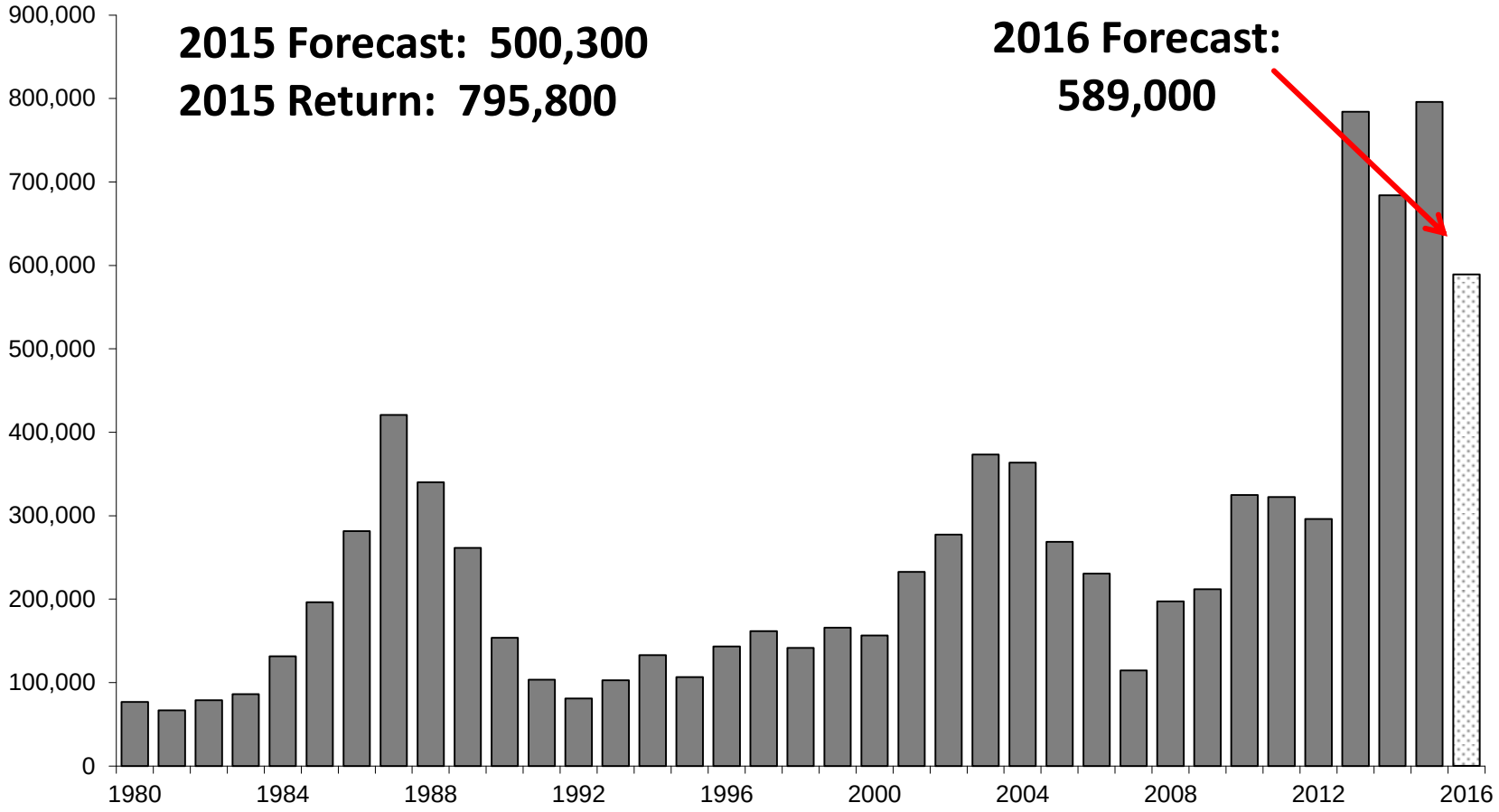
Bonneville Upriver Bright (BUB) Fall Chinook



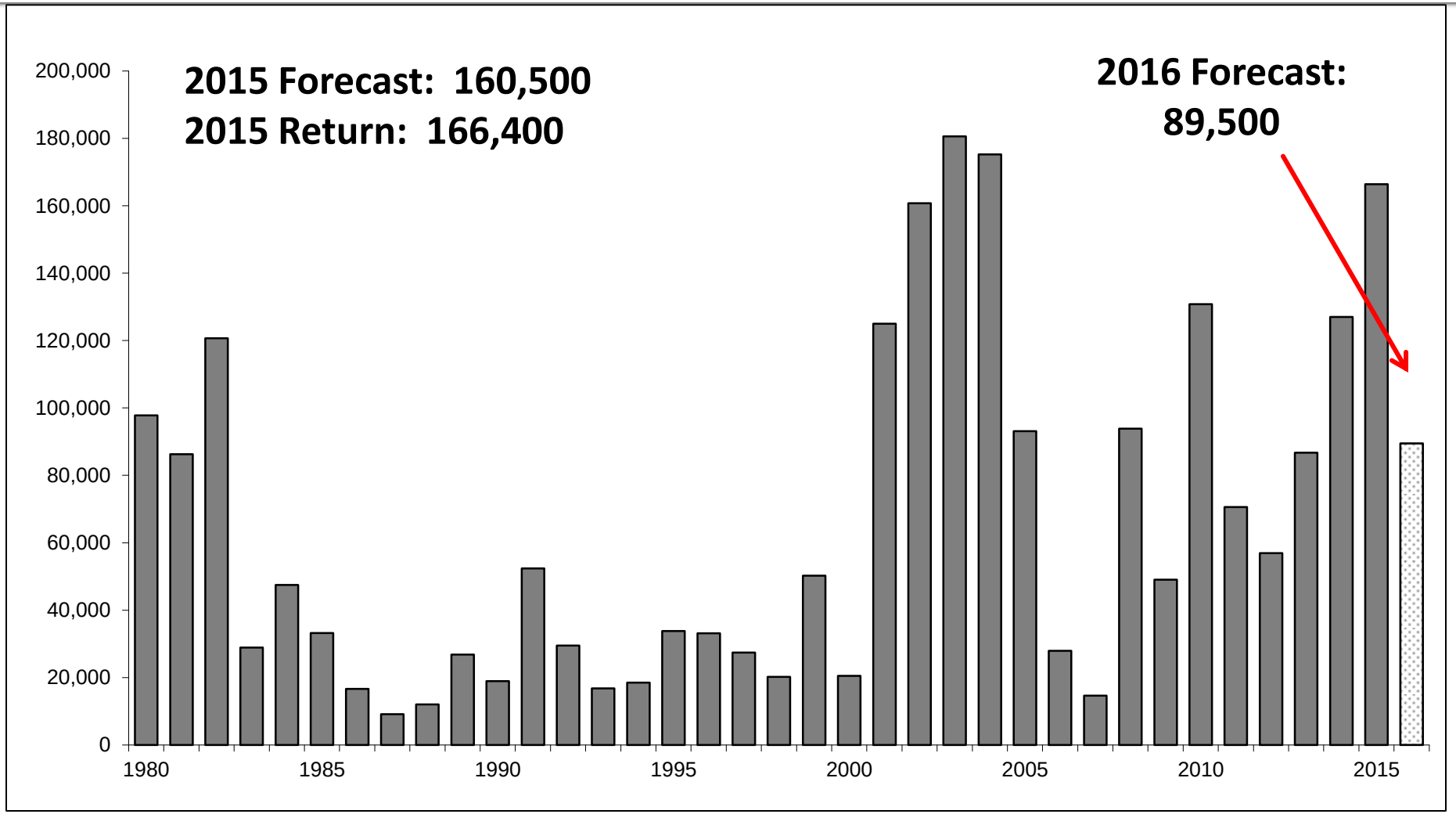
Pool Upriver Bright (PUB) Fall Chinook



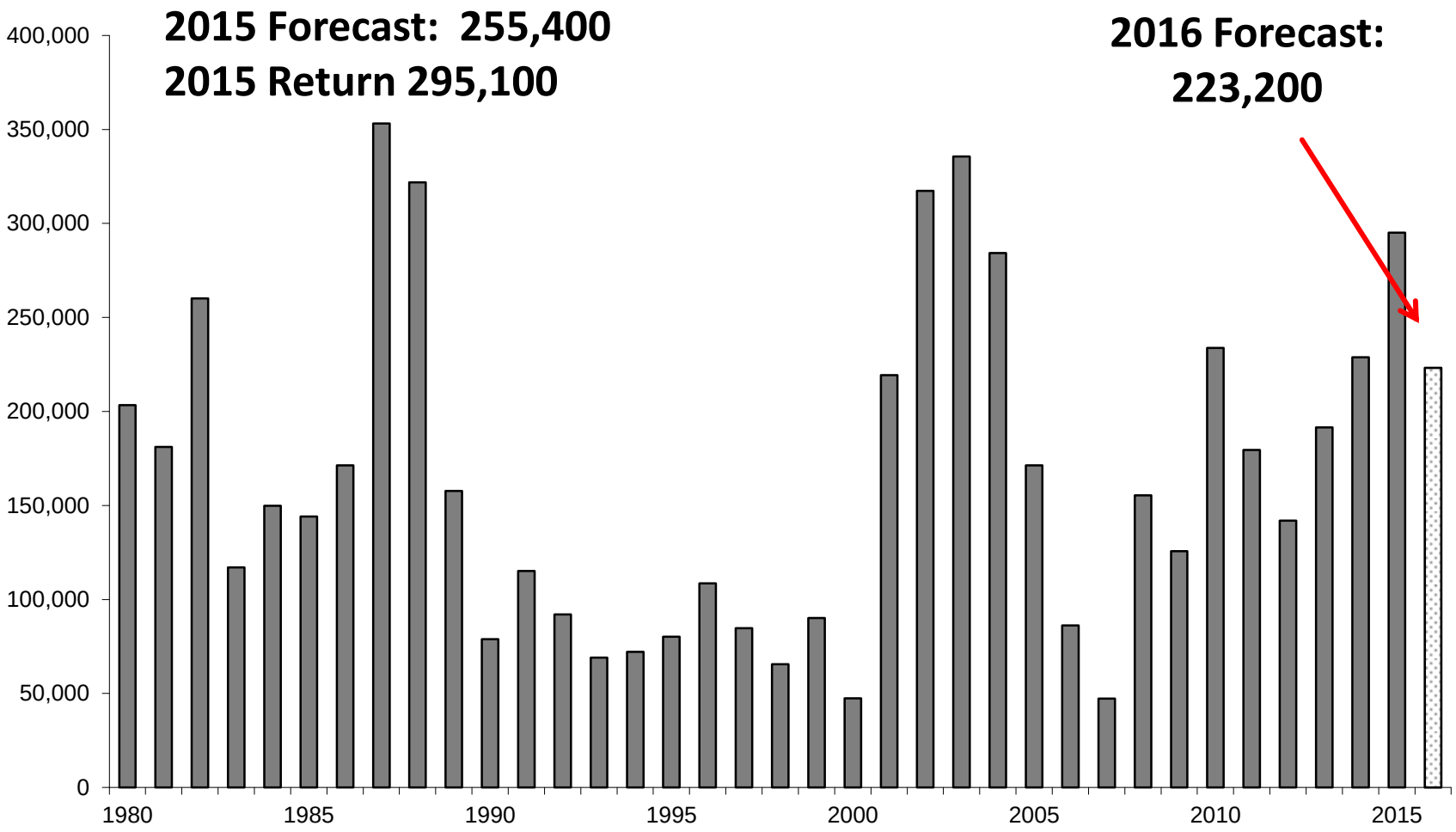
Upriver Bright (URB) Fall Chinook



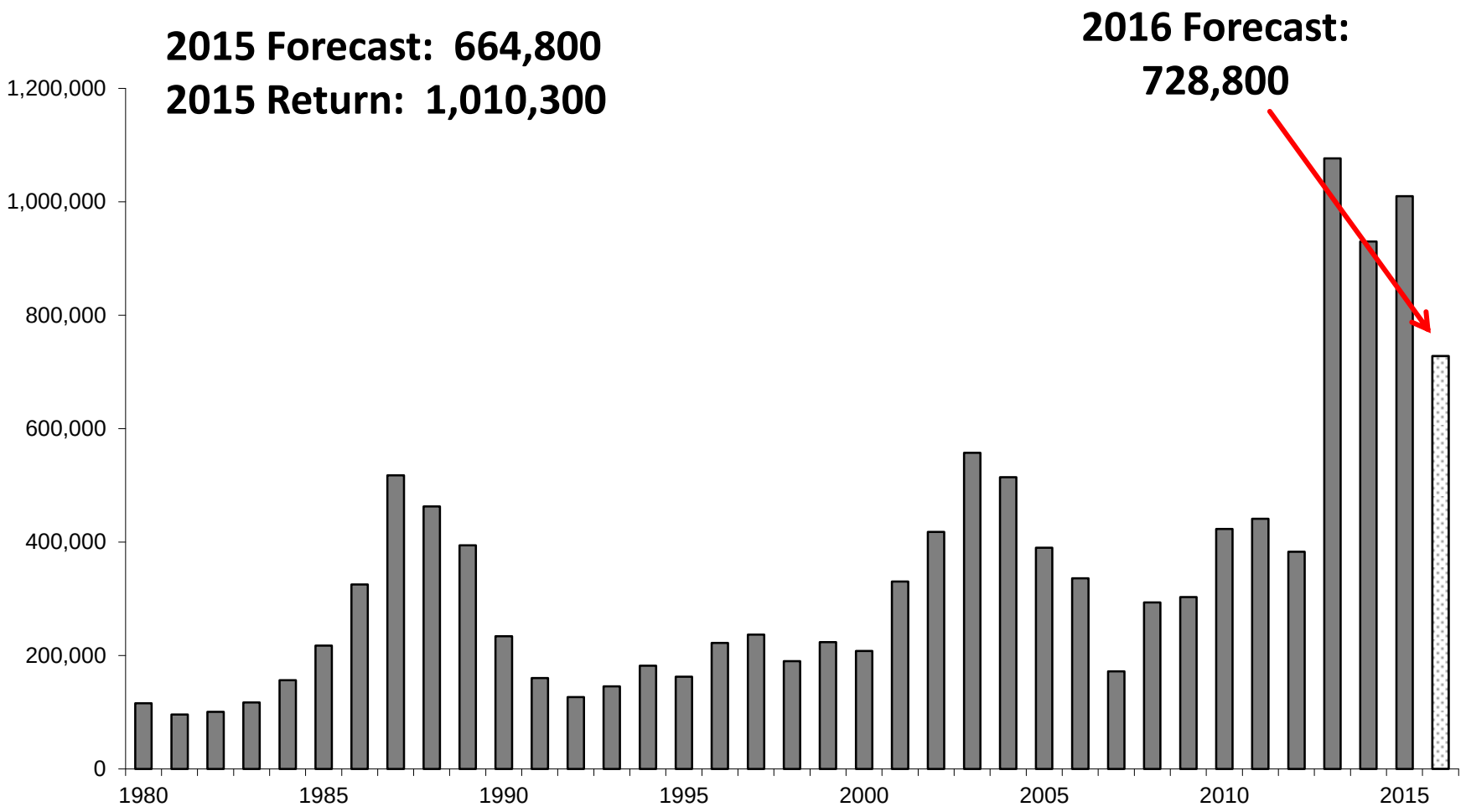
Bonneville Pool Hatchery (BPH) Fall Chinook



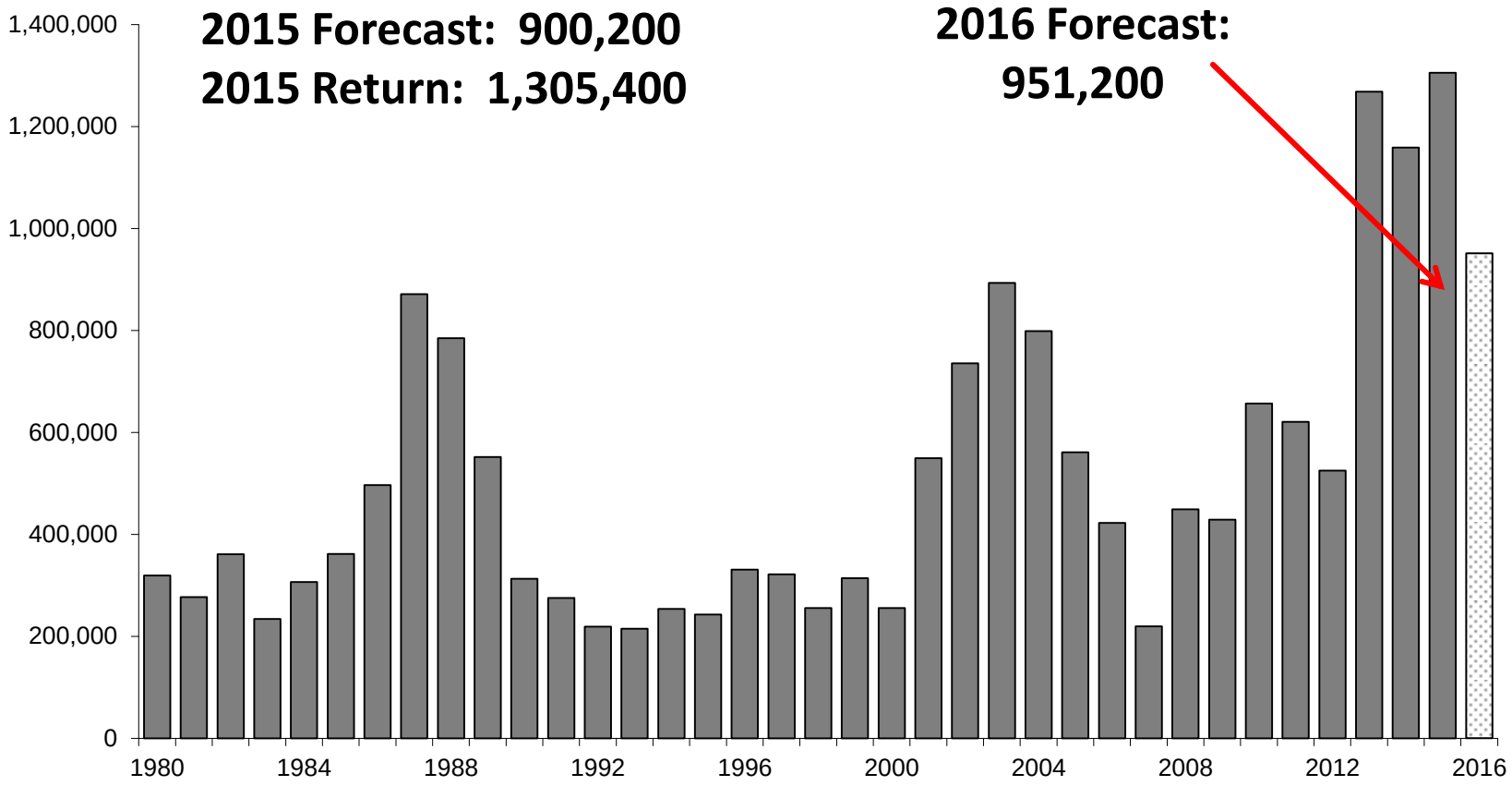
Total Tule Fall Chinook



Total Bright Fall Chinook



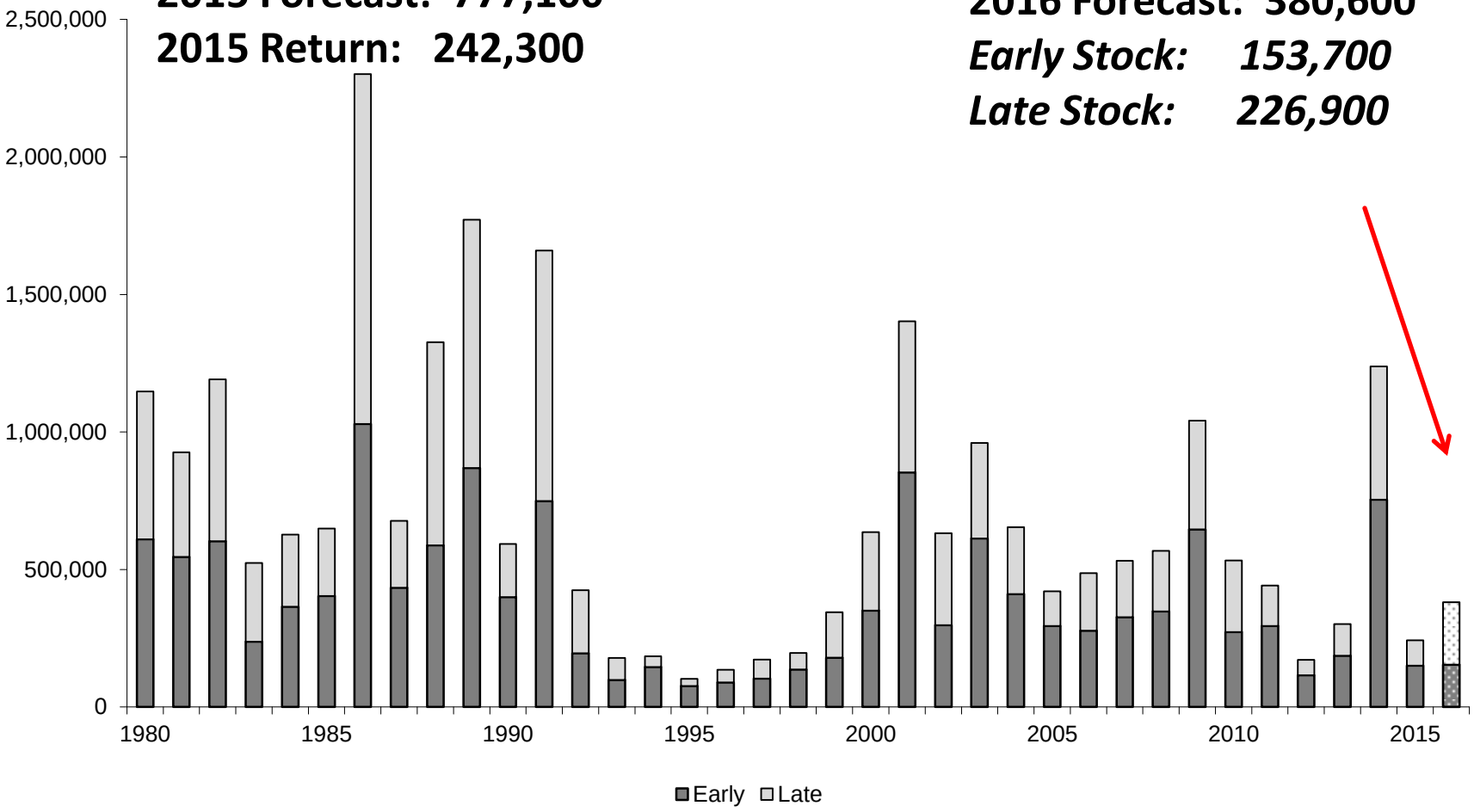
Total Fall Chinook



Columbia River Coho Ocean Abundance

2015 Forecast: 777,100
2015 Return: 242,300

2016 Forecast: 380,600
Early Stock: 153,700
Late Stock: 226,900



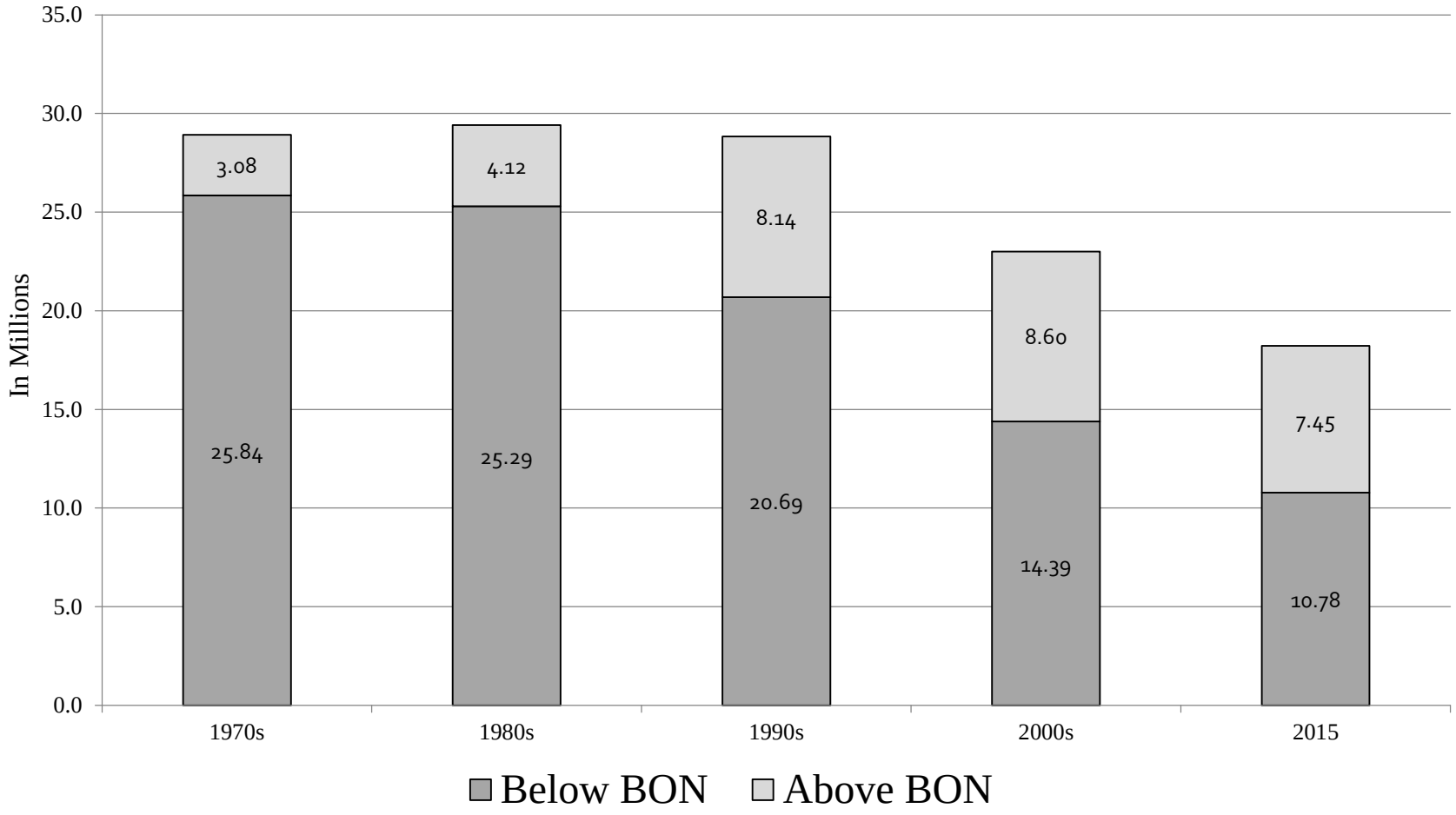
LCN Coho Exploitation Matrix

- Marine Survival Index
  (Hatchery Jack returns per smolt released)
  - Very Low ≤ 0.06%
  - Low ≤ 0.08%
  - Medium ≤ 0.17%
  - High ≤ 0.40%
  - Very High > 0.40%

- Allowed Exploitation Rate:
  - Very Low 10%
  - Low 15%
  - Medium 18%
  - High 23%
  - Very High 30%

- The marine survival index is 0.10% (medium) and the average 'seeding' for the indicator populations is 60% - well above the 30% minimum.
- Based on this information, the allowable exploitation rate for 2016 is 18%.

Columbia River Coho Releases
(in millions of fish)



Columbia River Coho - recap

- Survival rates have remained relatively stable in the 2000's (albeit, relatively low in 2015).
- Upriver coho releases increased steadily during 1970-1998, and have stabilized since.
- Lower Columbia River hatchery Coho releases have decreased overall since 1990's.
- Based on the new Coho matrix, the allowable exploitation rate in 2016 is 18%.

2016 Bottom Line

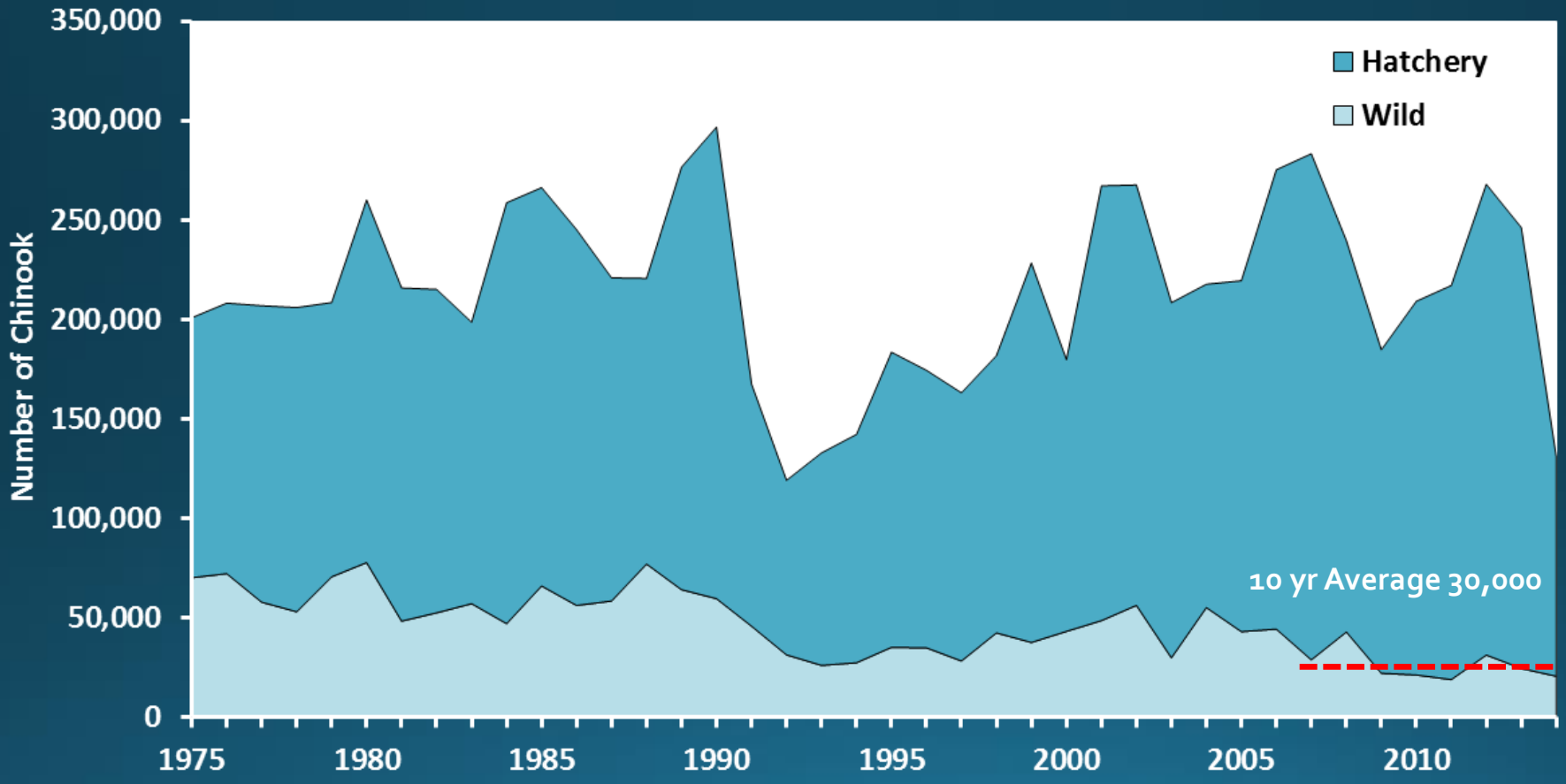
- Strong Fall Chinook return forecasted
  - Above average returns forecasted for all stocks
  - Estimate 951,200 adults
- Fair Columbia River Coho ocean forecast
  - Early stock (S) is poor, late stock (N) is average
  - Forecast is about 70% of the 10 year average
  - Estimate 380,600 adults (40% ‘S’ stock)

Questions?

WA Coast and Puget Sound 2015 Returns and 2016 Forecasts

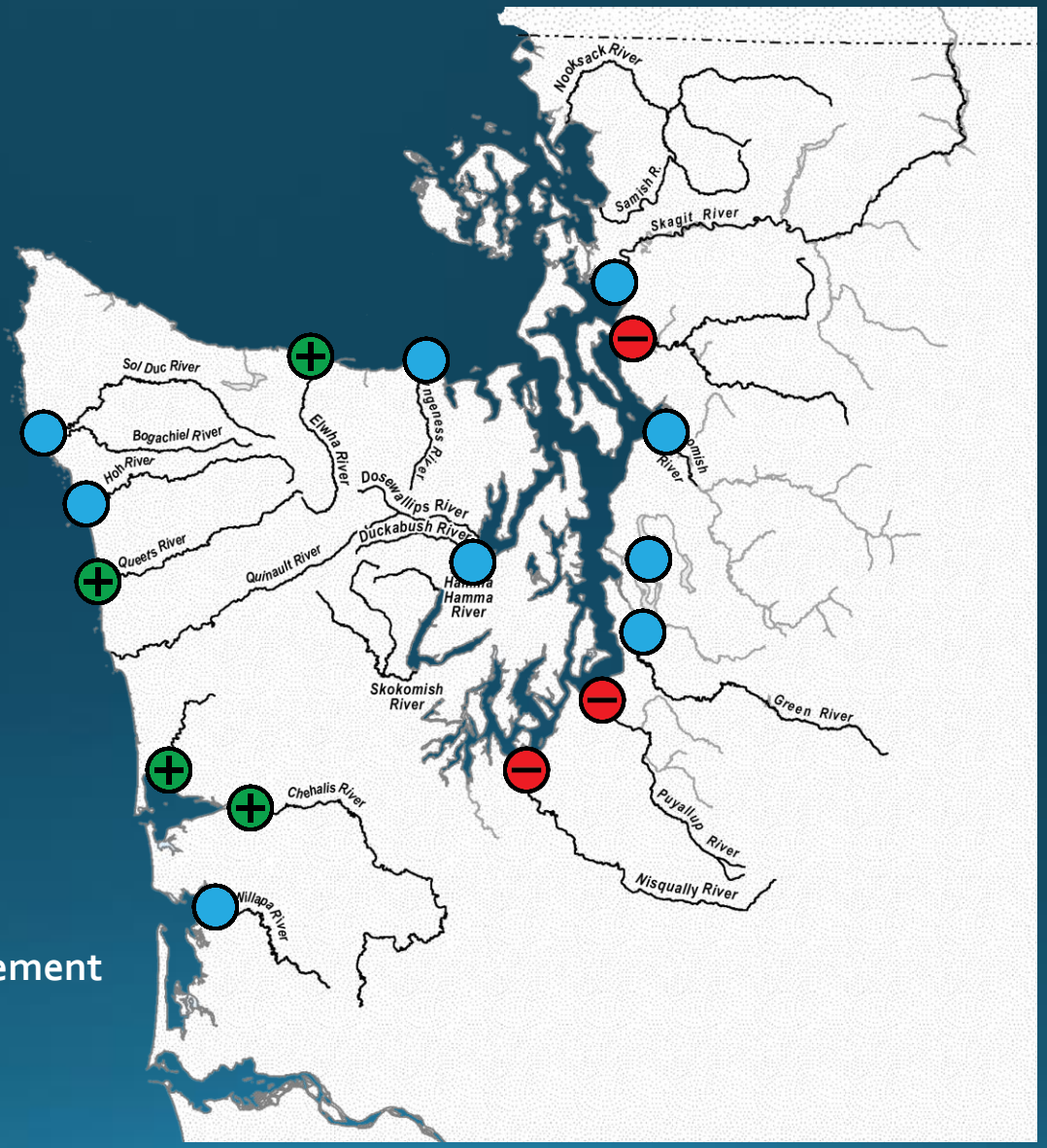
Chinook Salmon

Chinook Historical Runsize – Puget Sound



2015 Wild Fall Chinook Returns

- Returns range from Good to Poor
- Spawning distribution in many rivers effected by low water
- Lots of small winter 'blackmouth'

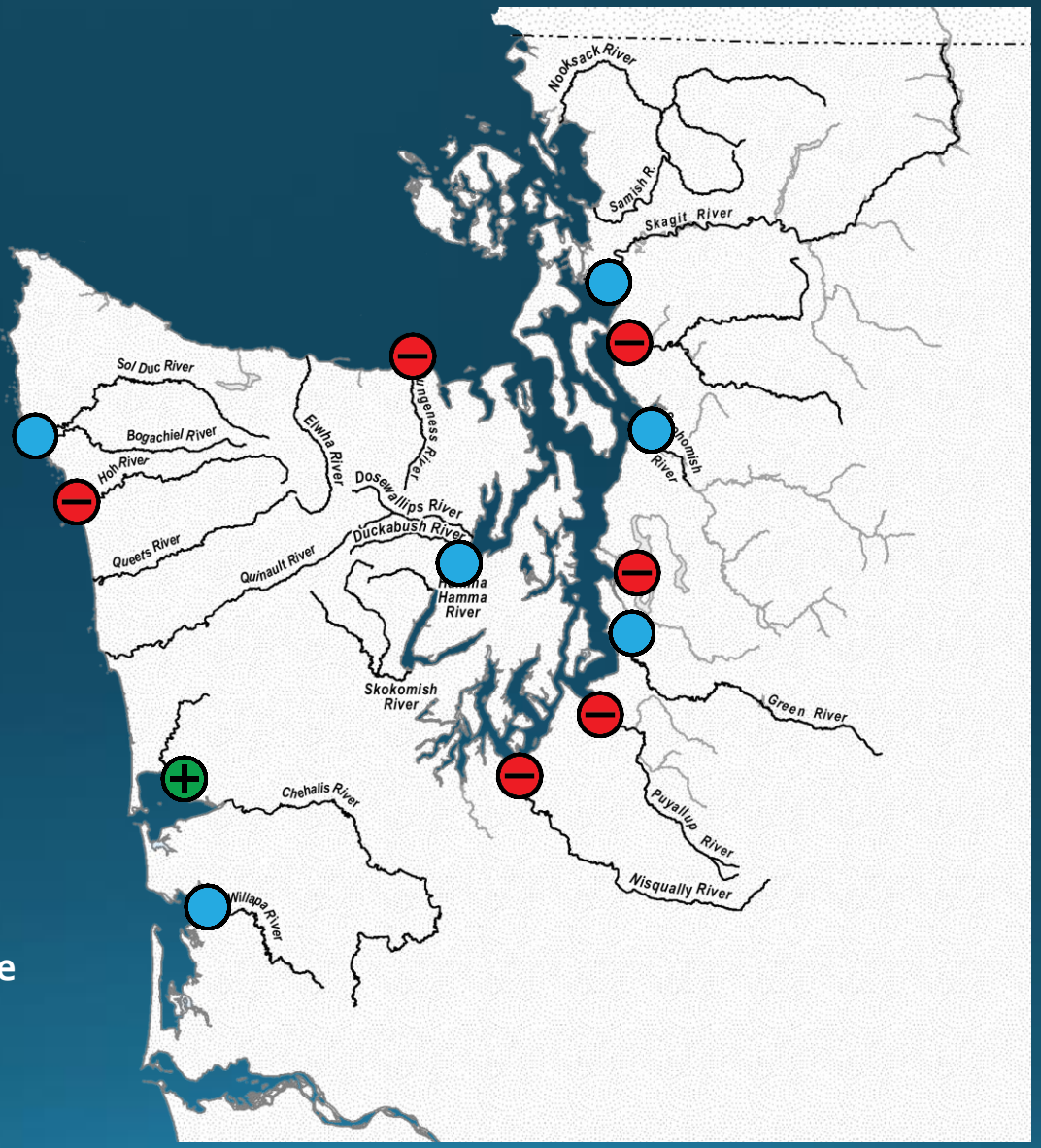


Relative to Recent 10yr Avg. Escapement

- Good > 125%
- Neutral 75-125%
- Poor < 75%

2016 Wild Fall Chinook Forecasts

- Forecasts in Puget Sound and Coast range from Good to Poor
- Poor ocean conditions leading to increased forecast uncertainty

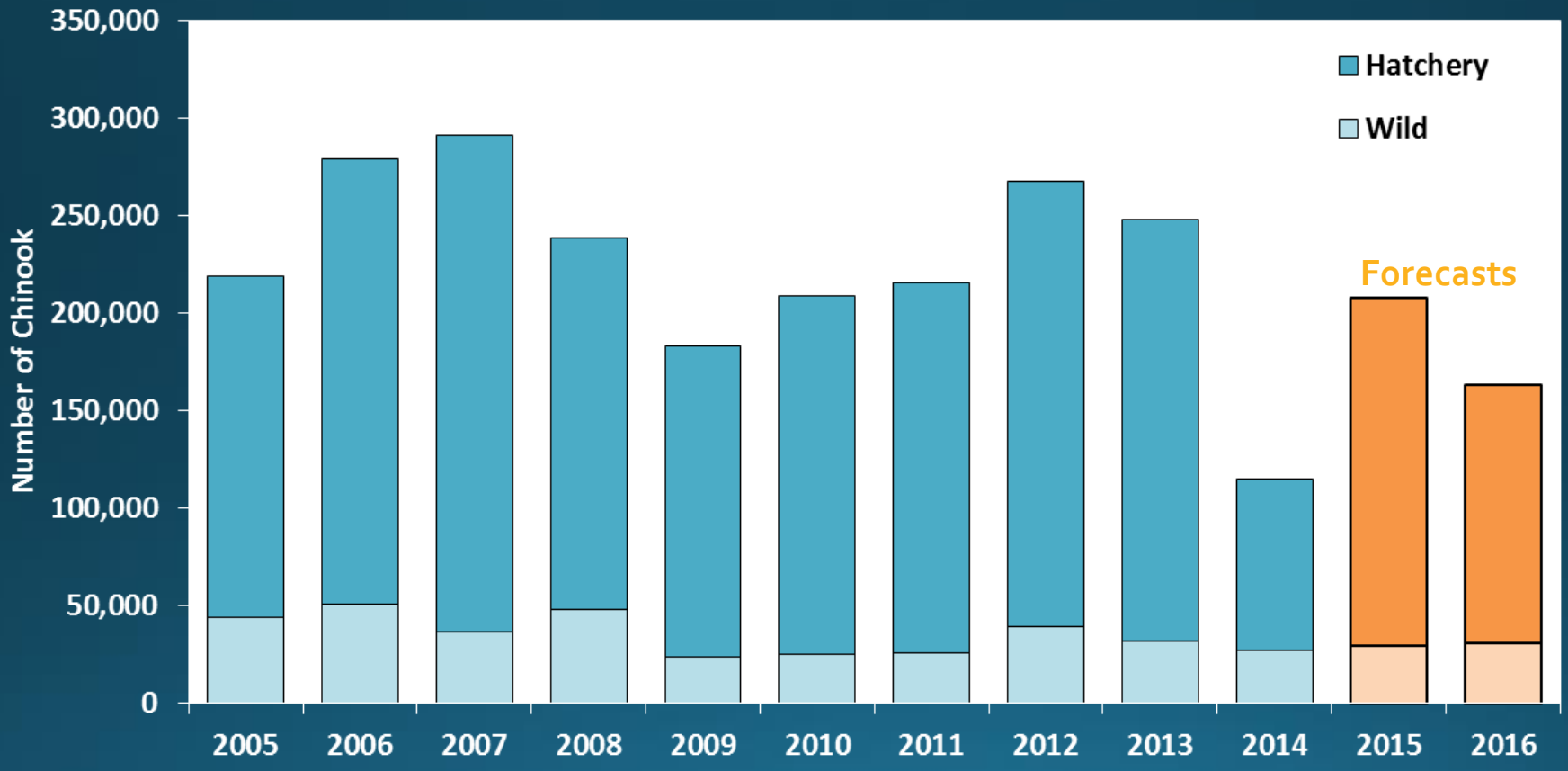


Relative to Recent 10yr Avg. Runsize

- Good > 125%
- Neutral 75-125%
- Poor < 75%

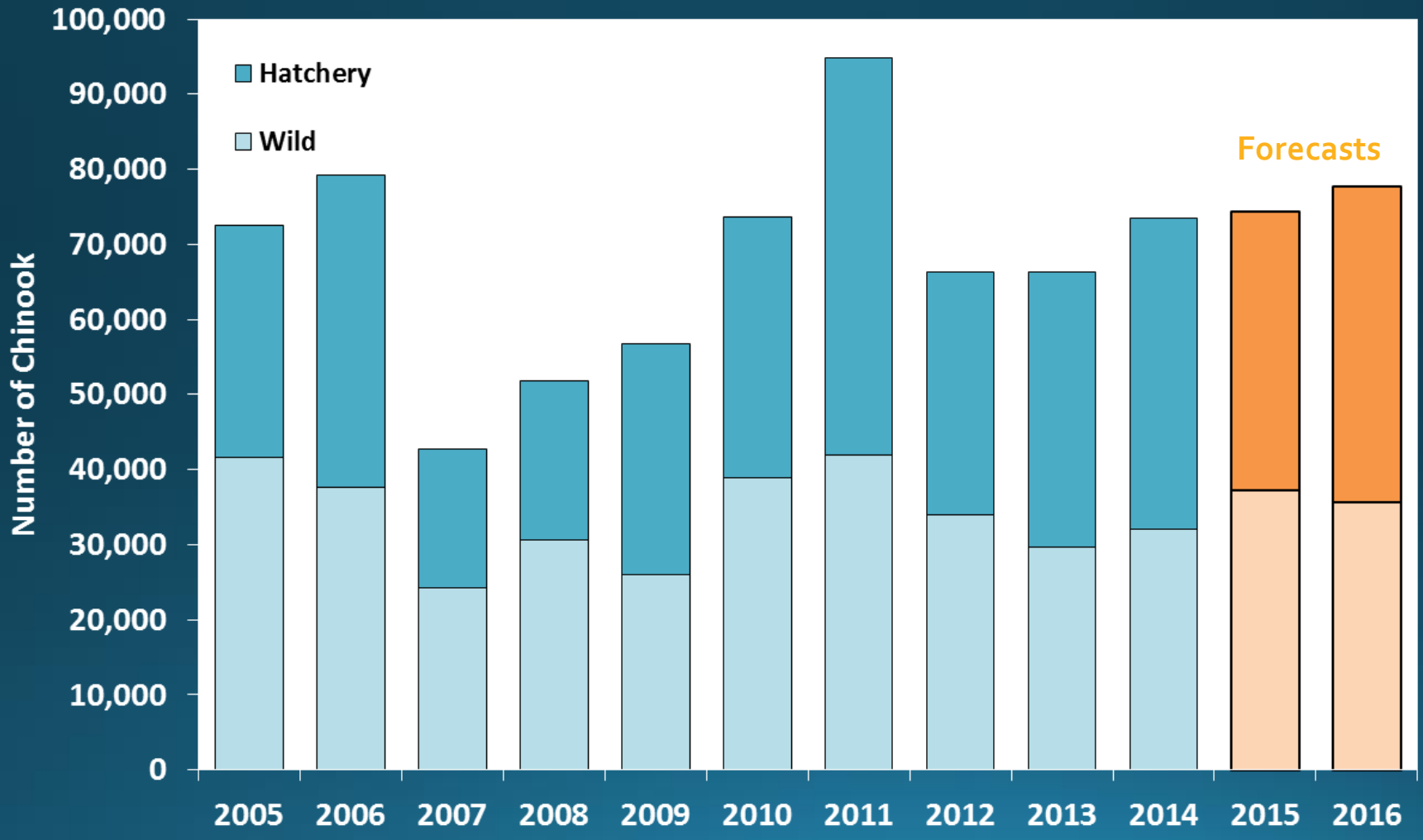
P. Sound Hatchery Chinook Forecasts

Puget Sound hatchery Chinook forecast ⬇31% from recent 10 year avg
(⬇ 26% from 2015 forecast)



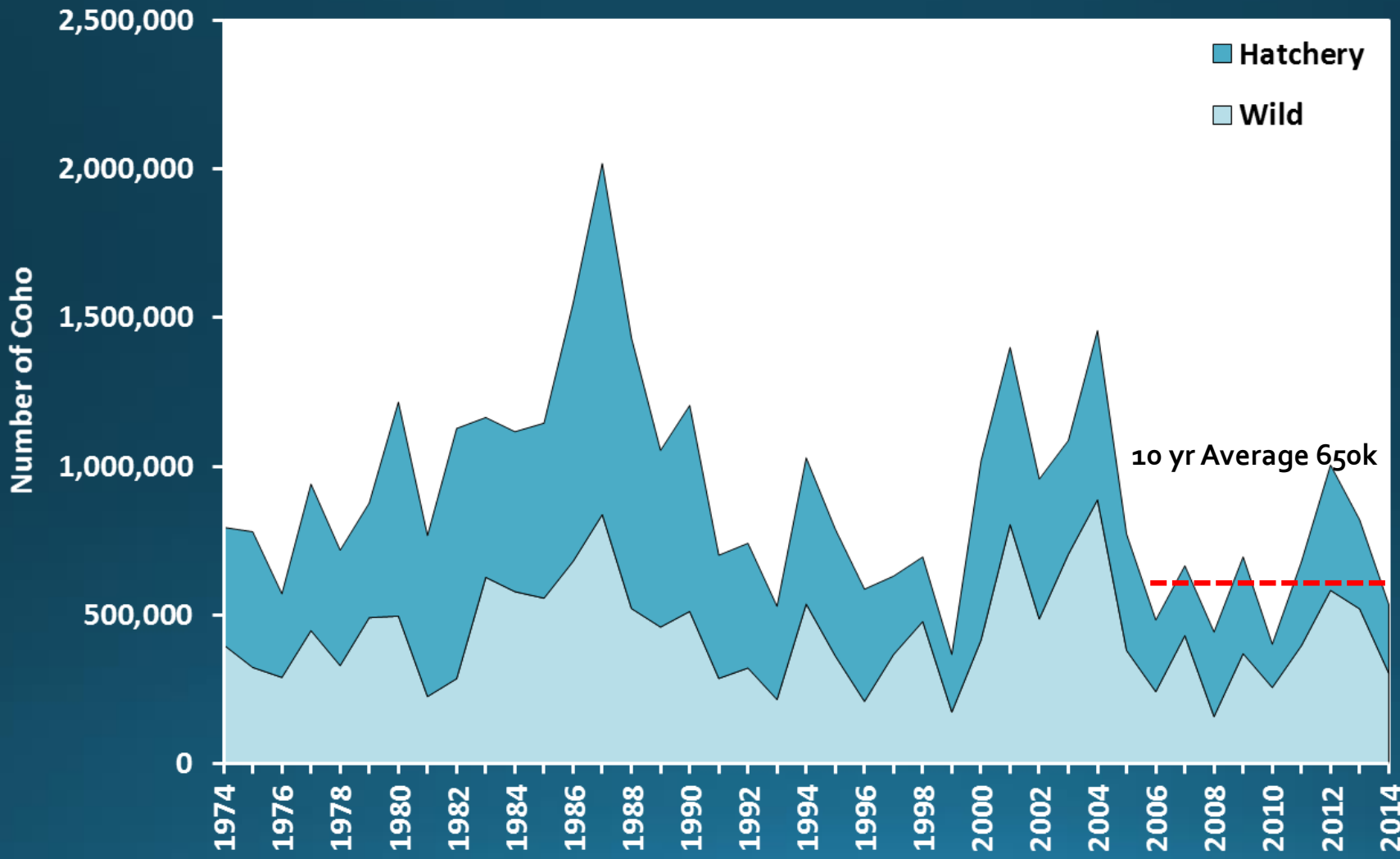
Coastal Chinook Forecasts

Coastal Chinook forecast ⬆ 14% compared to recent 10 year avg.



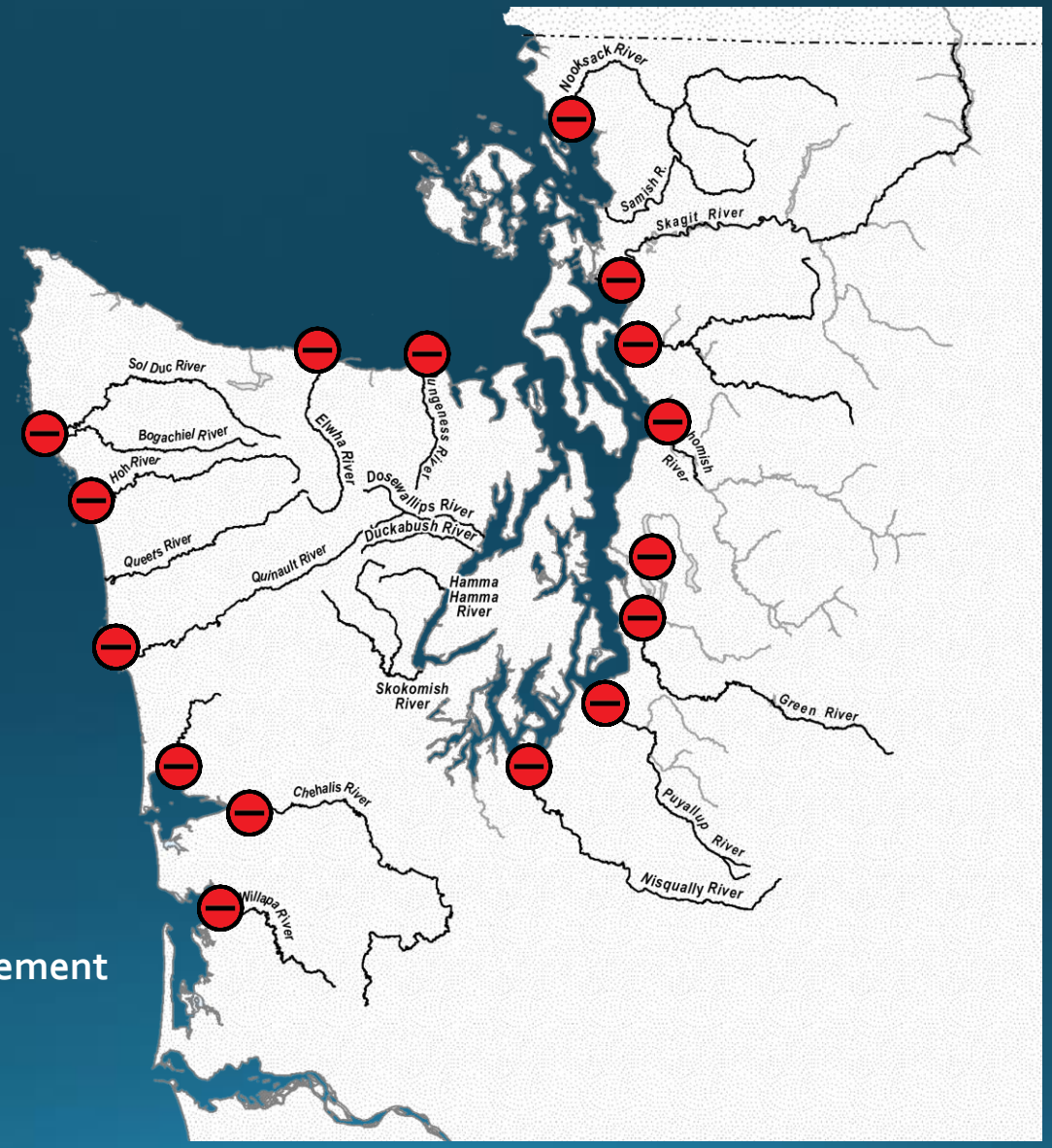
Coho

Coho Historical Runsize – Puget Sound



2015 Wild Coho Returns

- Returns were unanimously Poor across Puget Sound and Coast
- Small body size and reduced fecundity

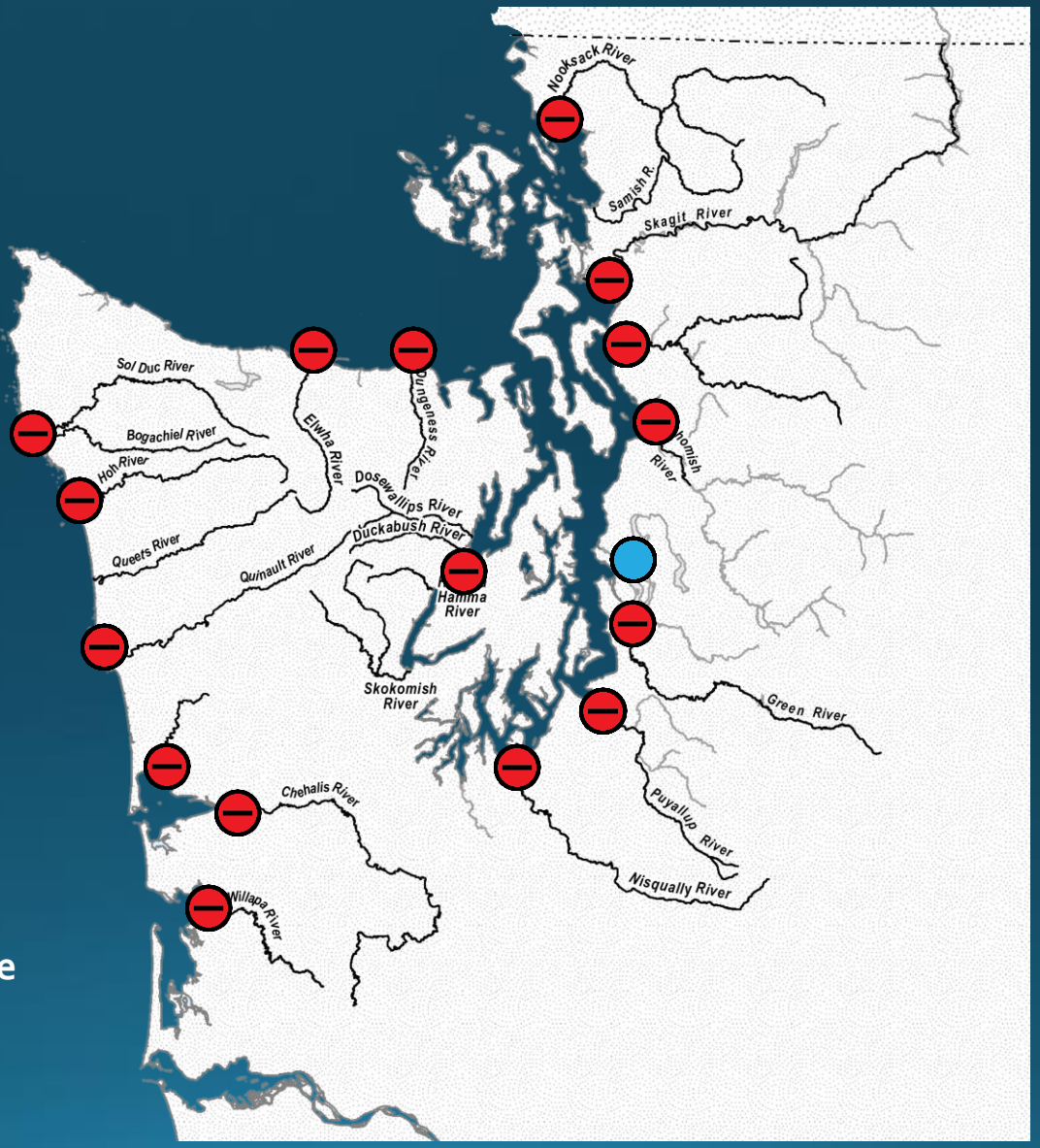


Relative to Recent 10yr Avg. Escapement

- Good > 125%
- Neutral 75-125%
- Poor < 75%

2016 Wild Coho Forecasts

- Forecasts Poor across Puget Sound and Coast
- Poor ocean conditions driving factor in low forecasts

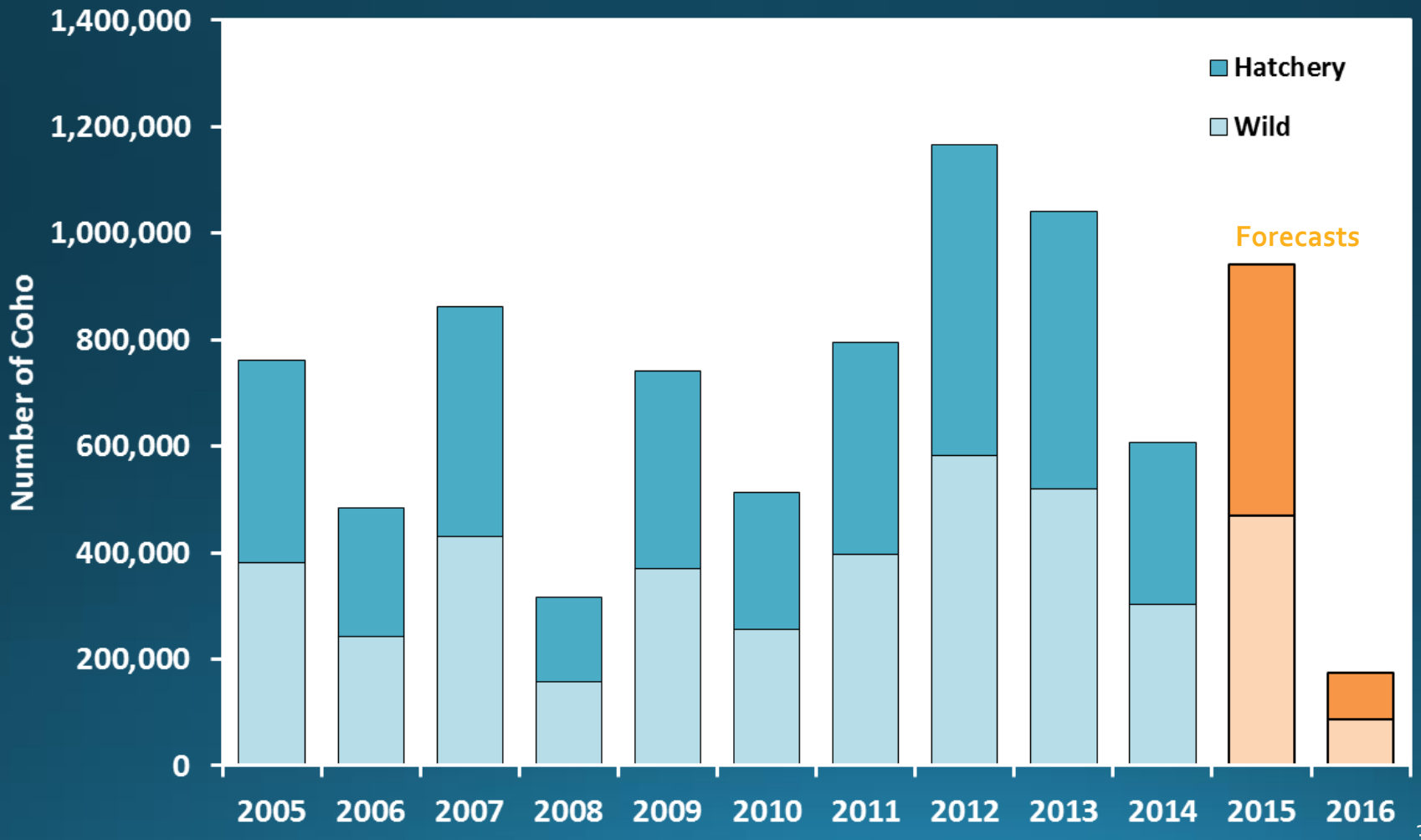


Relative to Recent 10yr Avg. Runsize

- Good > 125%
- Neutral 75-125%
- Poor < 75%

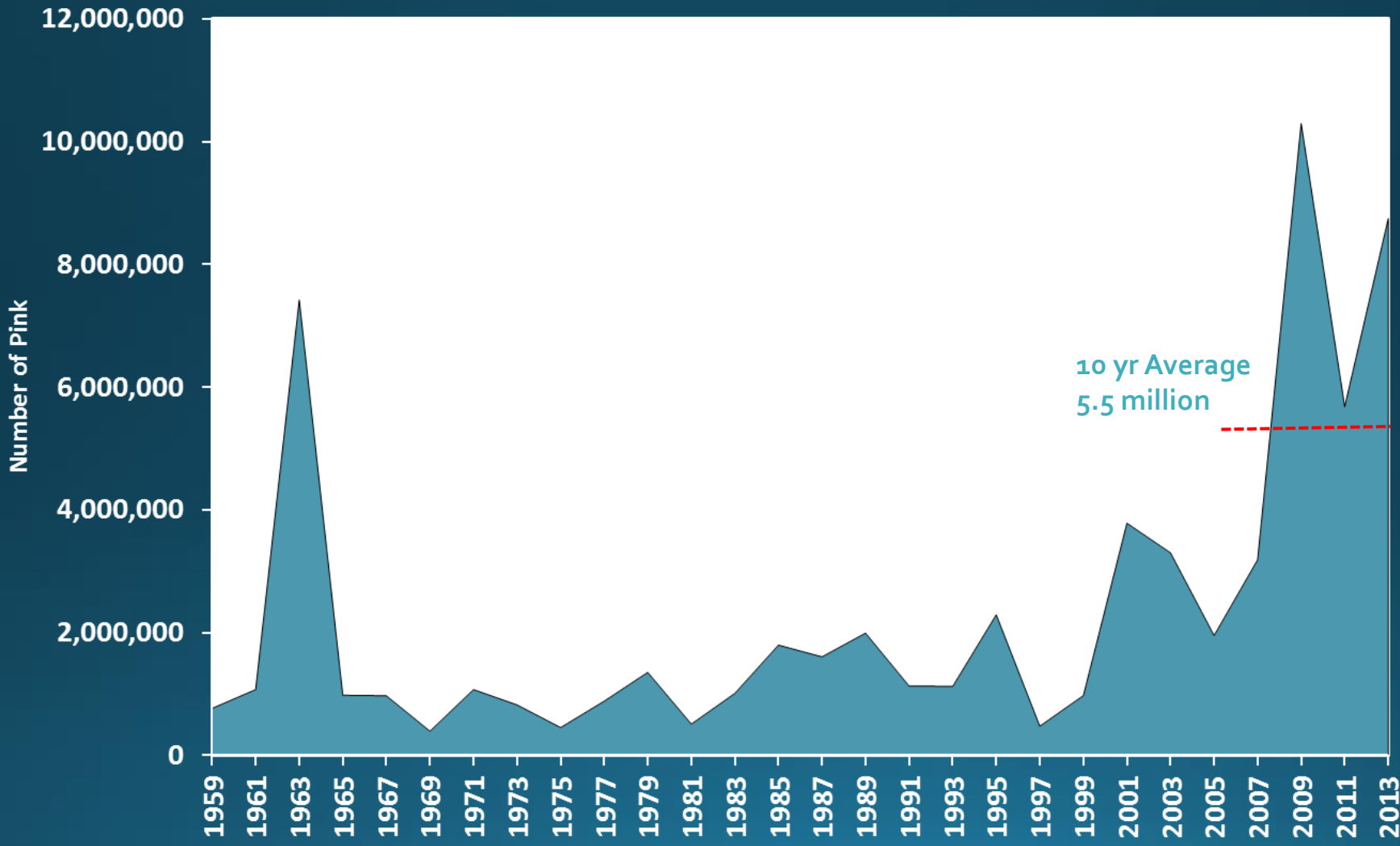
P. Sound Hatchery Coho Forecasts

Aggregate Puget Sound Coho forecast ⬇ 60% from recent 10 year avg.
(⬇ 71% compared to 2015 forecast)



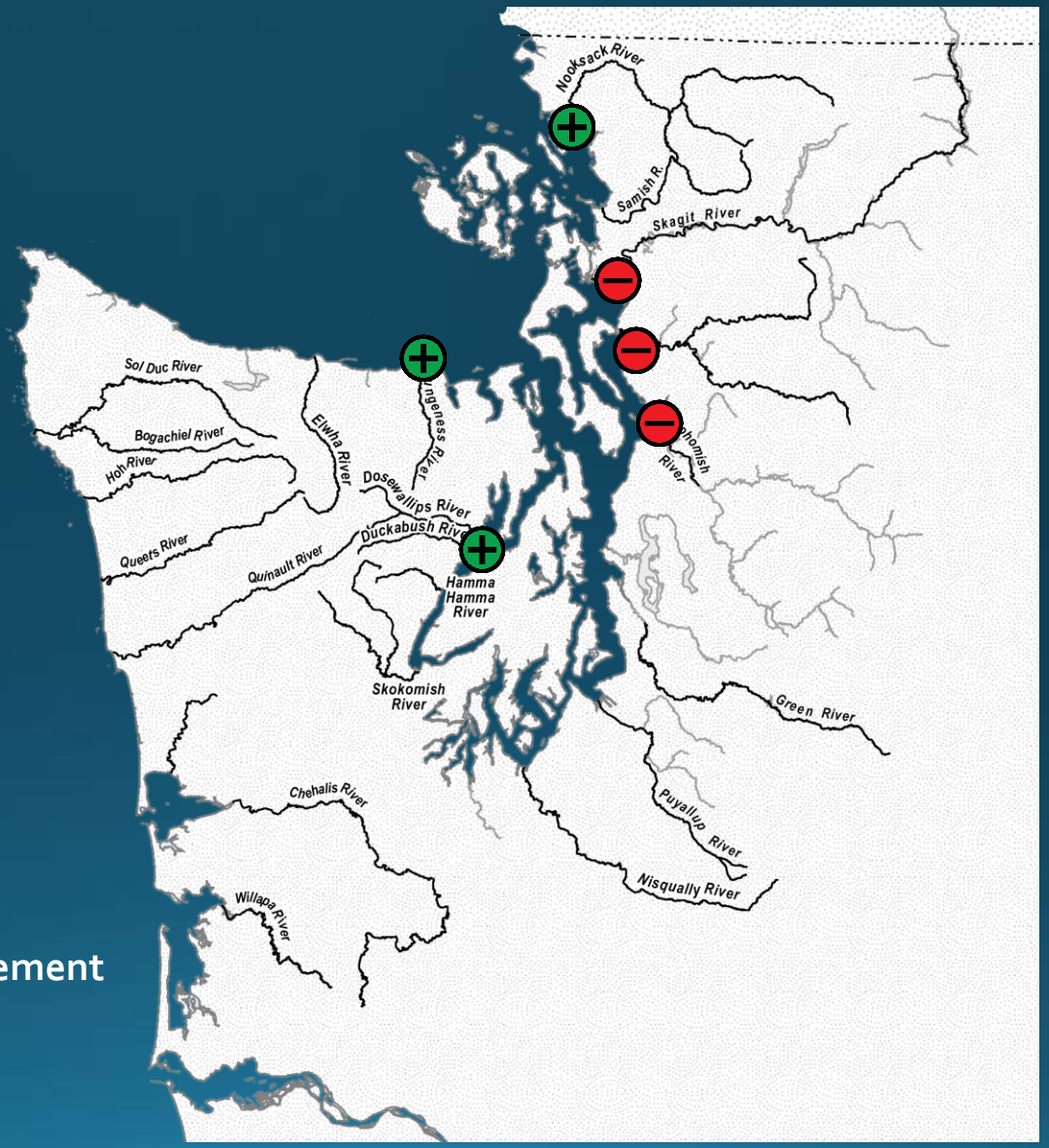
Pink

Pink Historical Runsize



2015 Pink Returns

- Returns ranged from Good to Poor
- Small body size
- Data not compiled for many watersheds

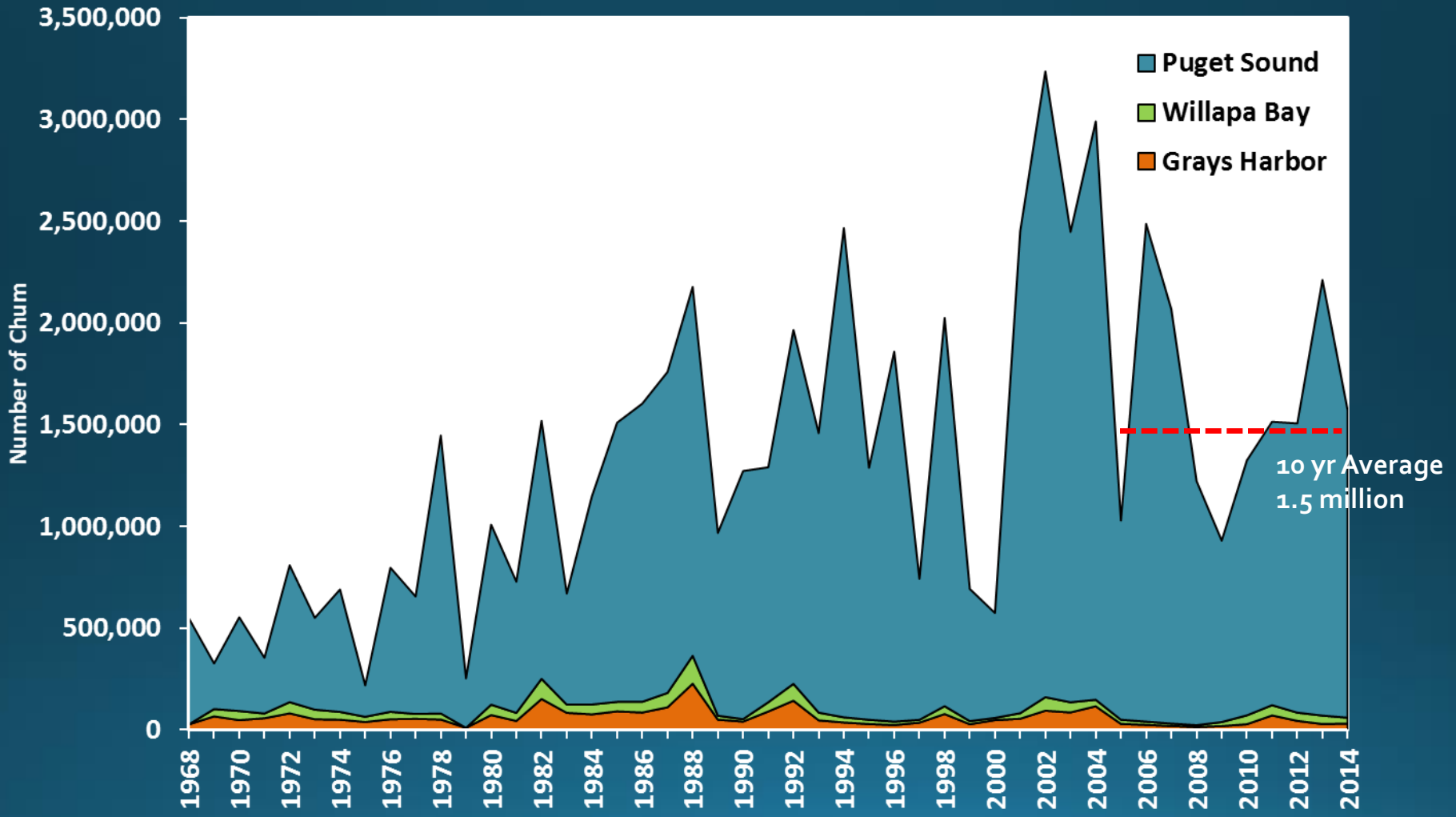


Relative to Recent 10yr Avg. Escapement

- Good > 125%
- Neutral 75-125%
- Poor < 75%

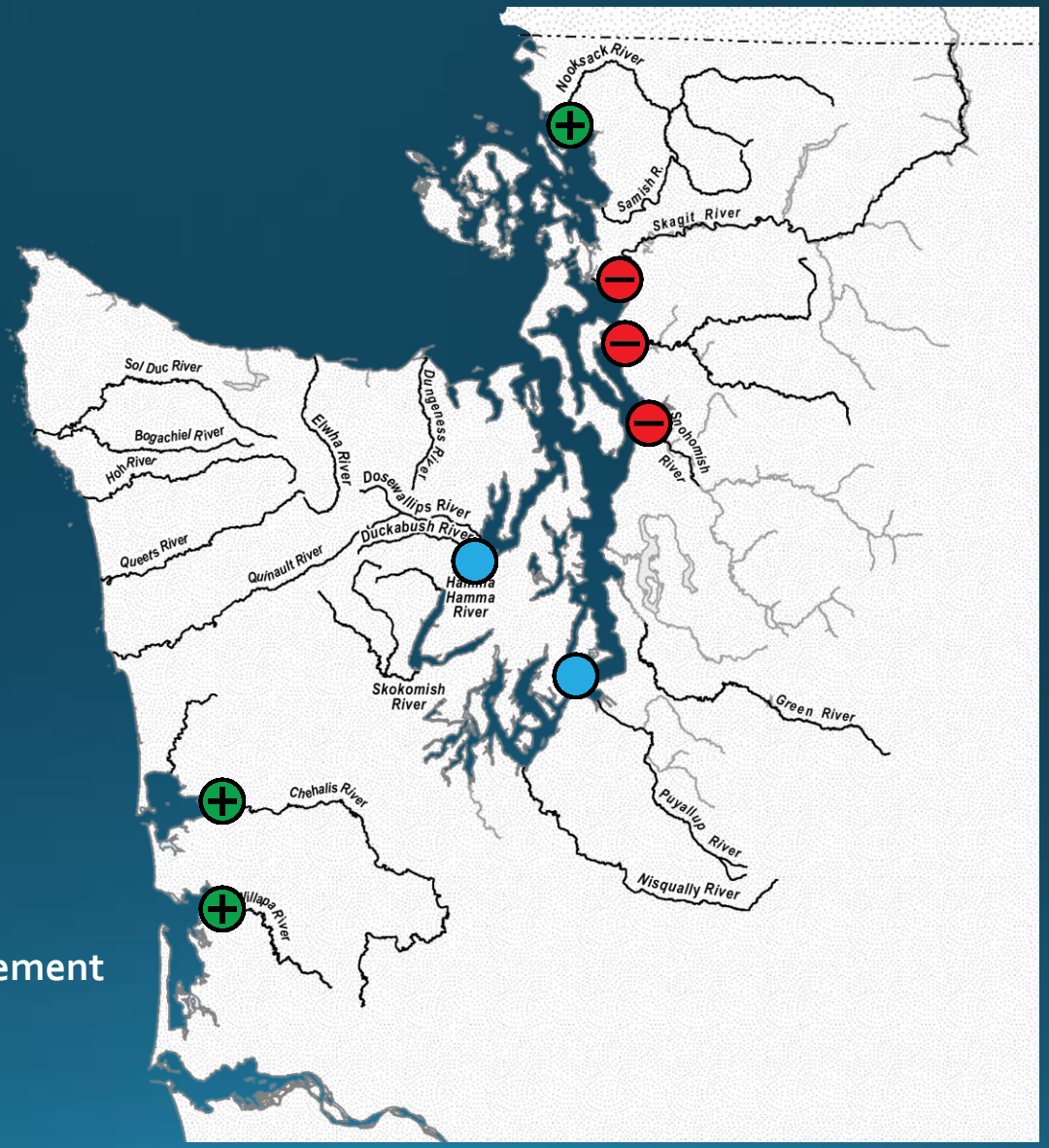
Chum

Chum Historical Runsize



2015 Fall Chum HOR/NOR Returns

- Returns ranged from Good to Poor
- Average body size
- Hood Canal and S. Puget Sound are relative to in-season updated runsizes, not escapement

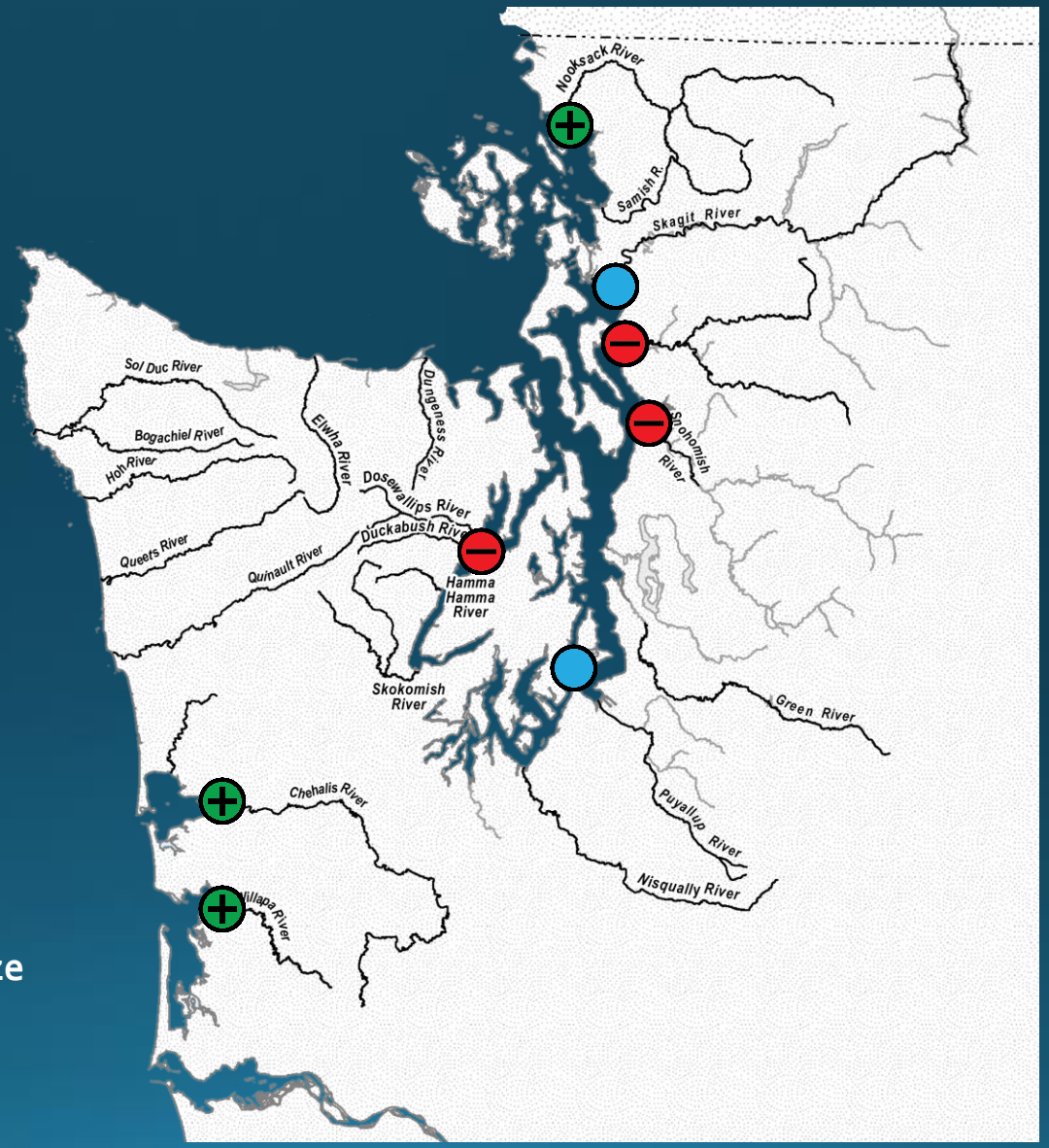


Relative to Recent 10yr Avg. Escapement

- Good > 125%
- Neutral 75-125%
- Poor < 75%

2016 Fall Chum HOR/NOR Forecast

- Forecasts range from Good to Poor
- Hood Canal - 490k
- Central/South Sound – 536k
- Coast – Willapa – 48k, Grays H – 36k

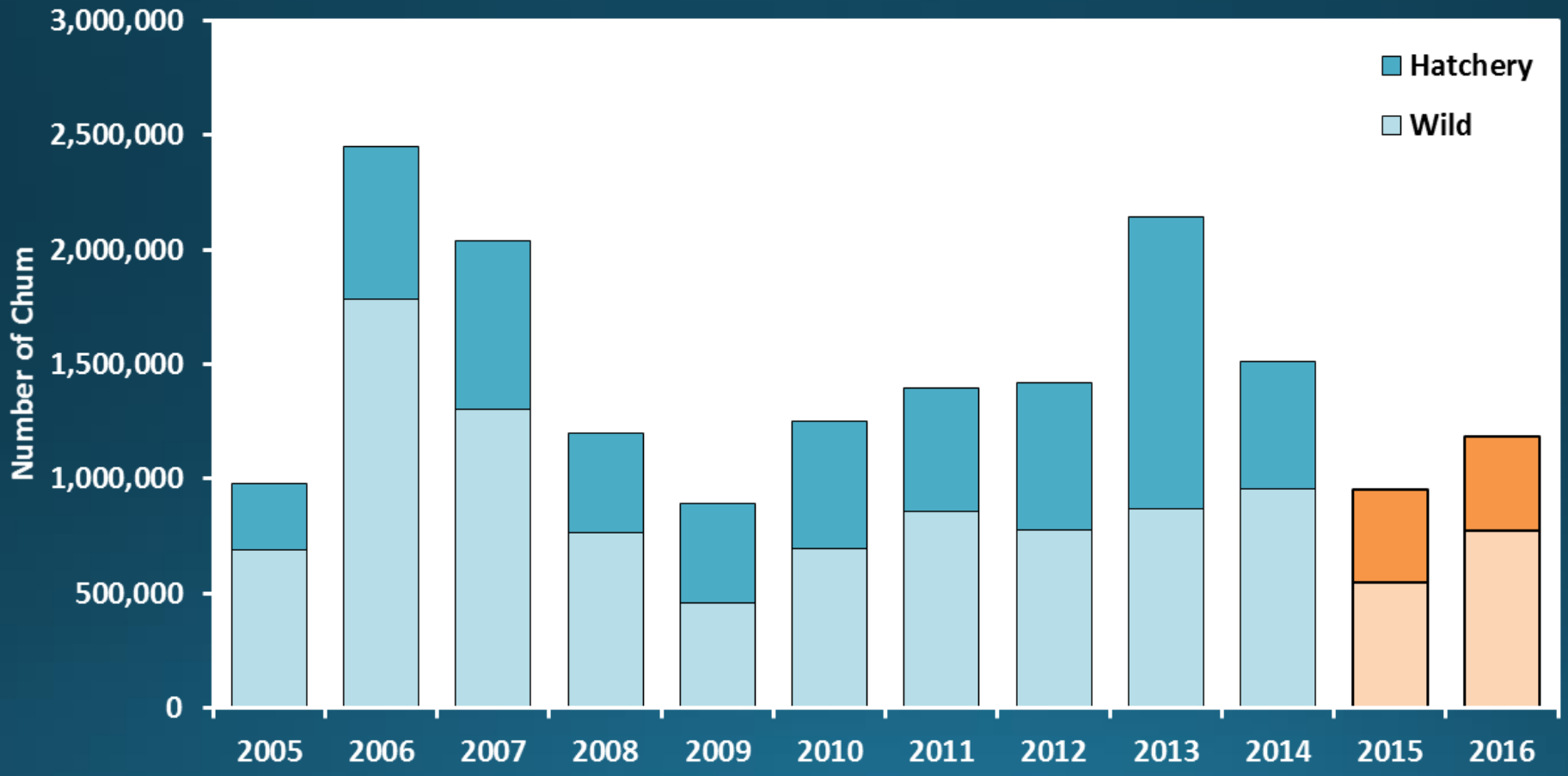


Relative to Recent 10yr Avg. Runsize

- Good > 125%
- Neutral 75-125%
- Poor < 75%

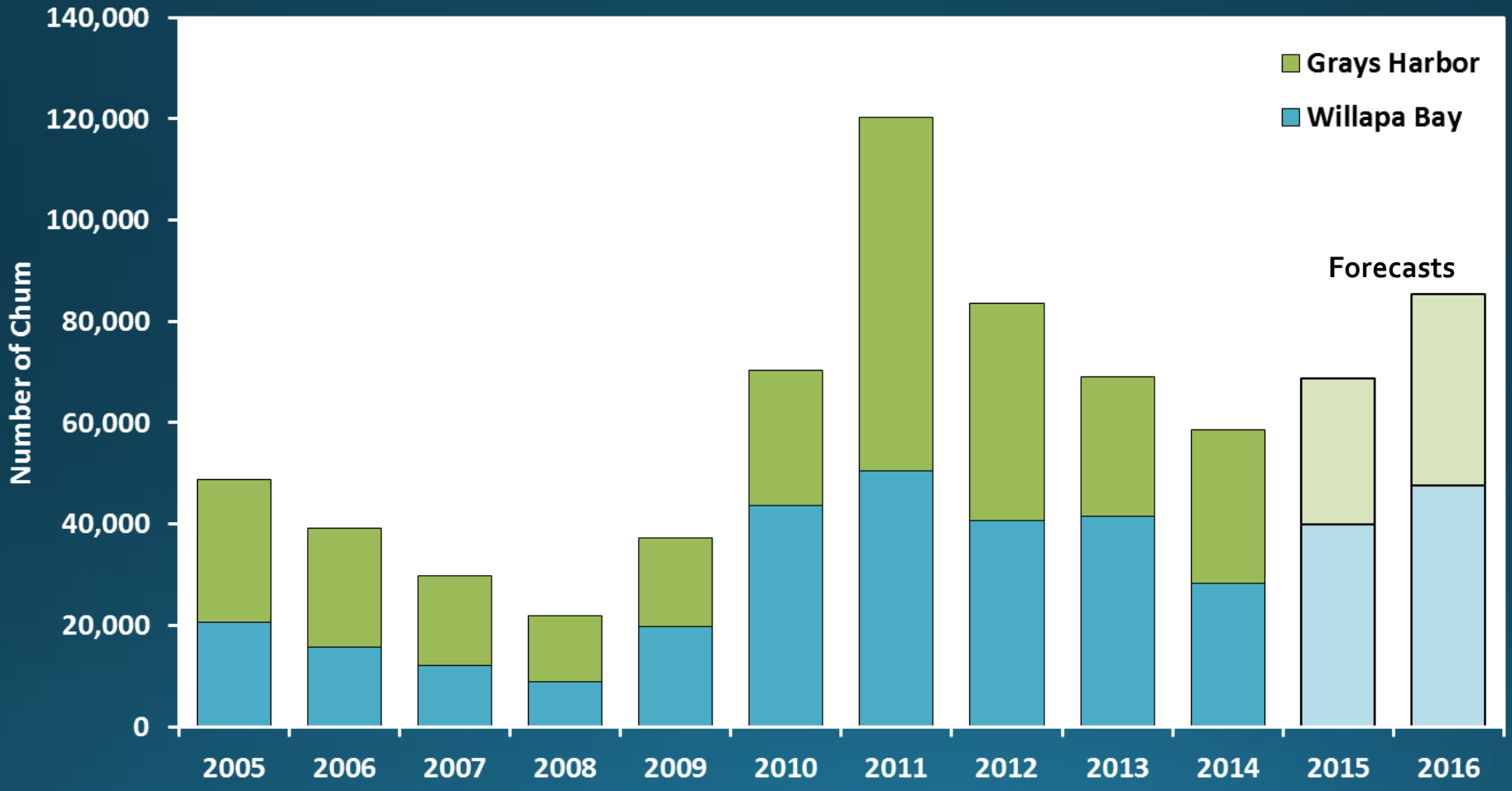
Puget Sound Chum Forecasts

Hatchery ⬇ 32% and Wild ⬇ 16% over recent 10 year avg.



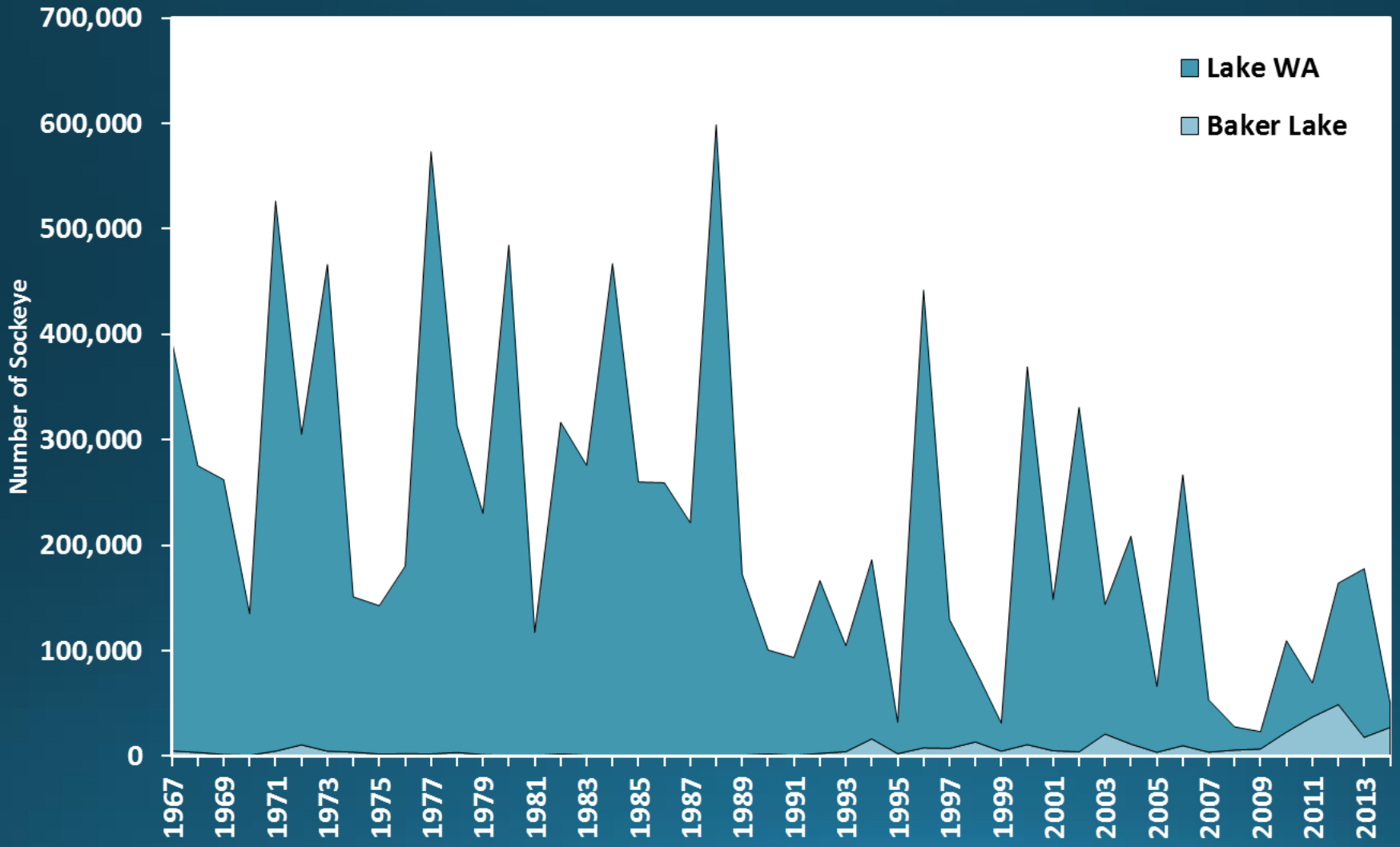
Coastal Chum Forecasts

Willapa Bay ⬆ 69% and Grays Harbor ⬆ 27% over recent 10 year avg.



Sockeye Forecasts

Puget Sound Sockeye Runsize



2015 Sockeye HOR/NOR Returns

- Returns ranged from Good to Poor
- Average body size
- Baker Lake had record return
- Lake WA had one of lowest returns on record

Relative to Recent 10yr Avg. Escapement

- Good > 125%
- Neutral 75-125%
- Poor < 75%

2016 Sockeye HOR/NOR Forecast

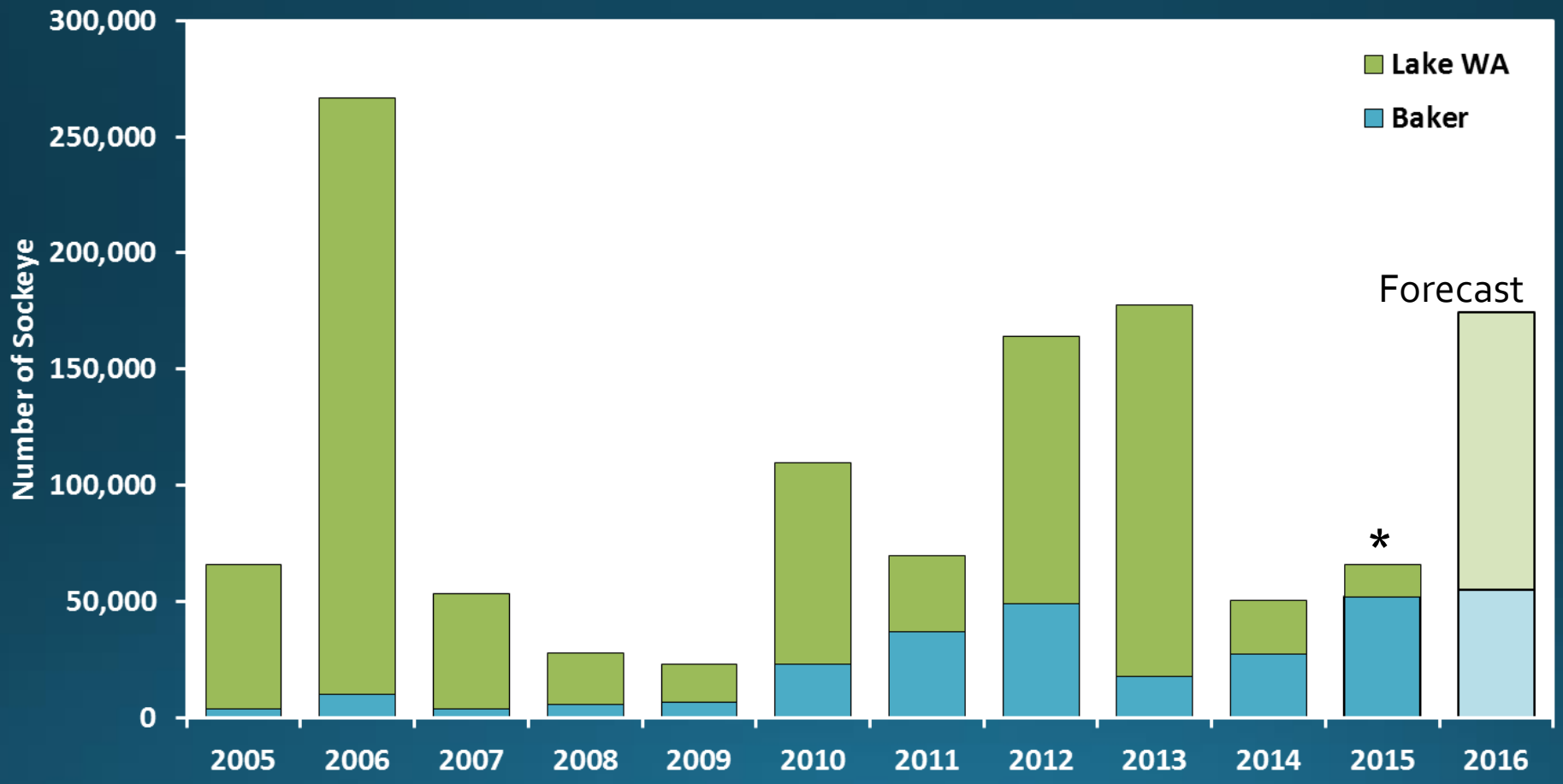
- Record forecast for Baker Lake – 55k
- Lake WA forecast highly uncertain – 119k
- Columbia river - 102k

Relative to Recent 10yr Avg. Runsize

- Good > 125%
- Neutral 75-125%
- Poor < 75%

Sockeye Forecasts

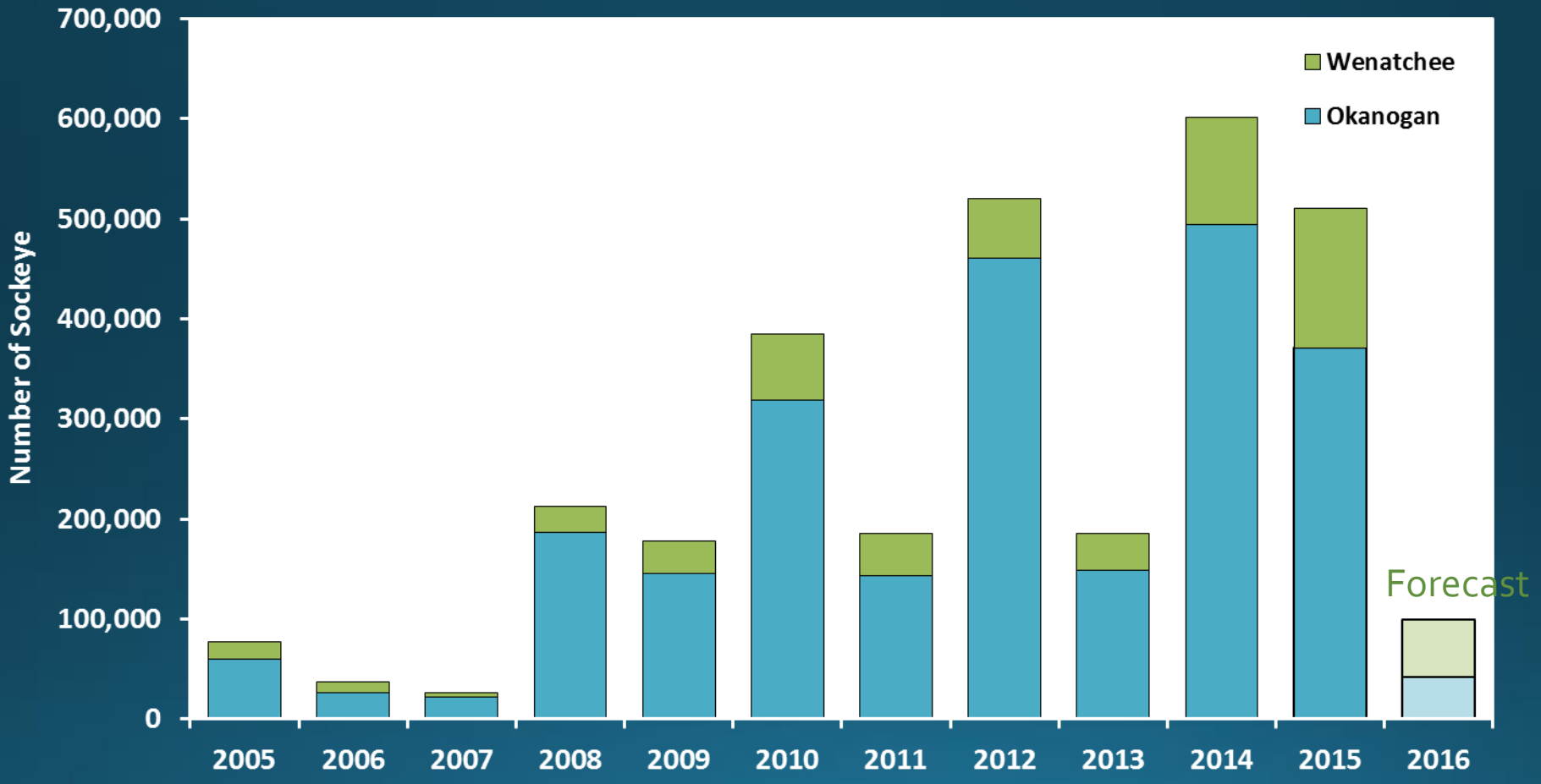
Lake WA ⬆ 53% and Baker ⬆ 137% over recent 10 year avg.



*Preliminary Return

Sockeye Forecasts

Lake Wenatchee ⬆ 17% and Baker ⬇ 15% over recent 10 year avg.

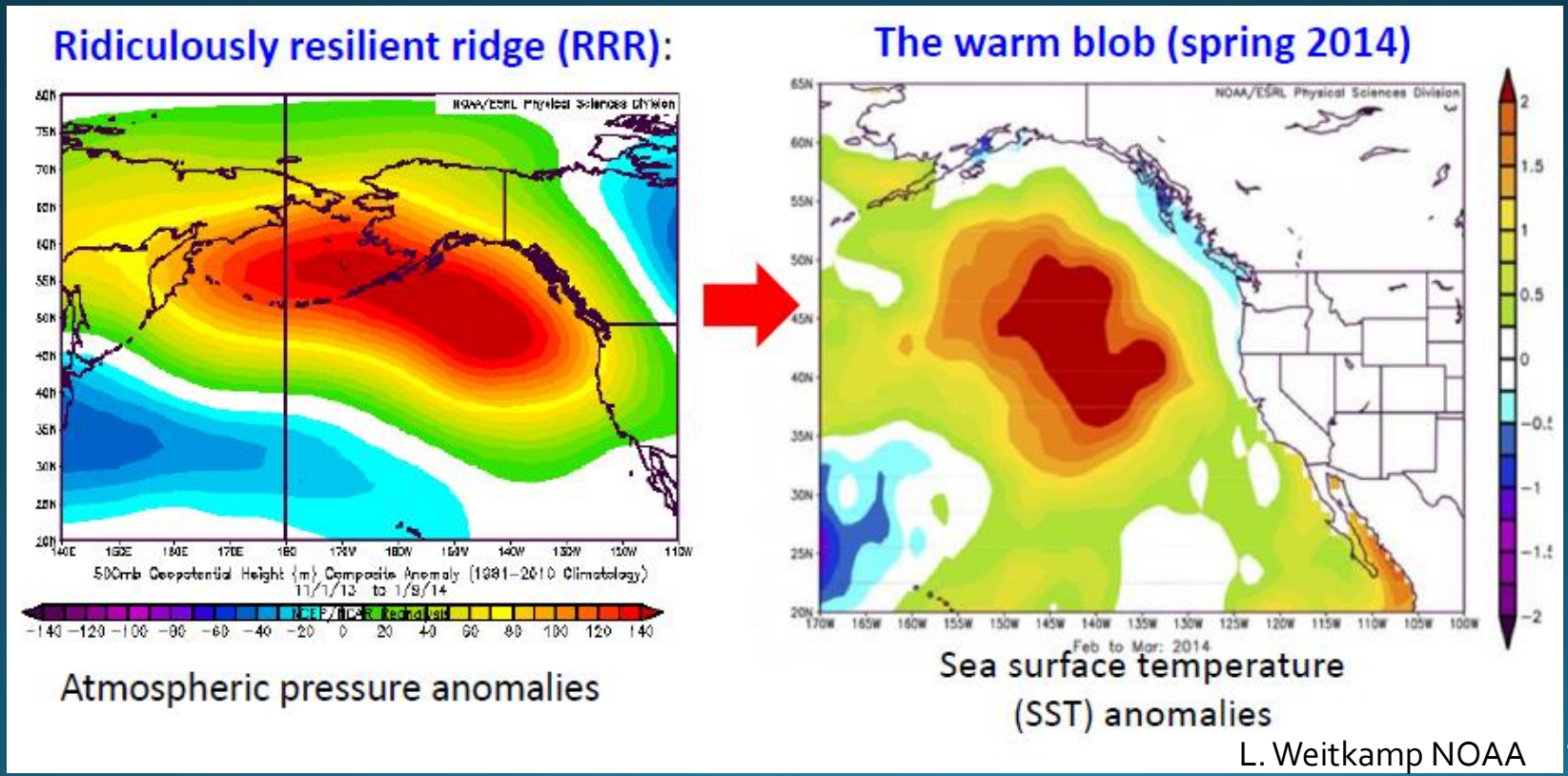


*Preliminary Return

2015/16 Environmental Conditions

Warm Blob - Cause of 2015 Low Returns?

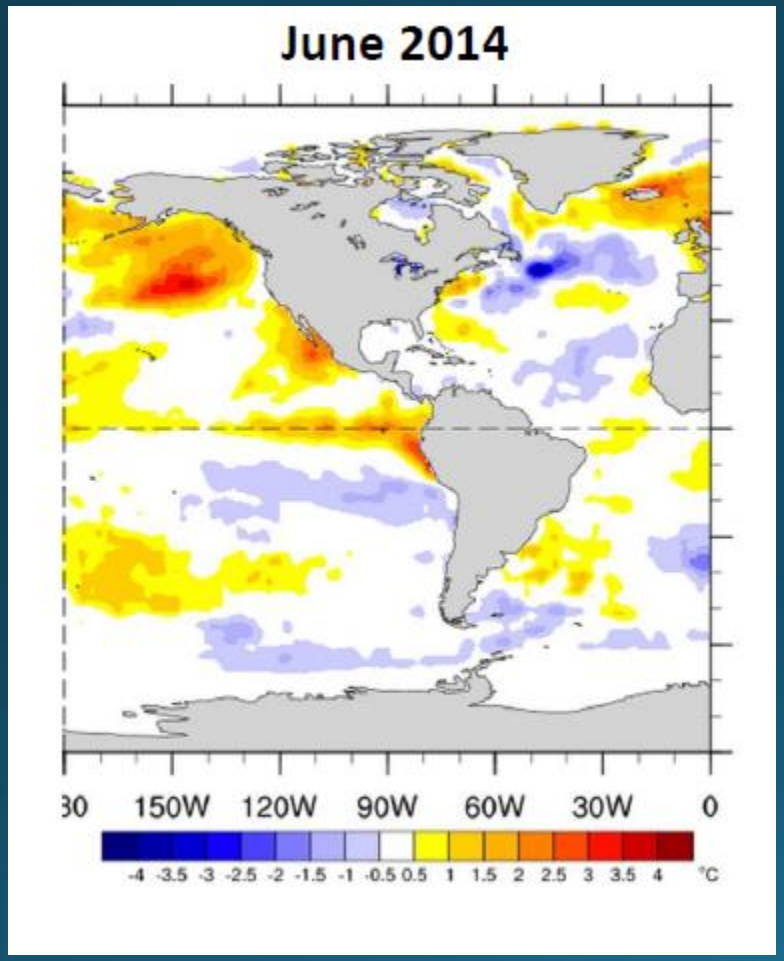
- Prevailing hypothesis - low returns caused by the "Warm Blob"
- Warm Blob - Caused by high pressure over the N. Pacific in winter 2013/14
  - blocked storms that normally mix upper surface waters and redistribute heat

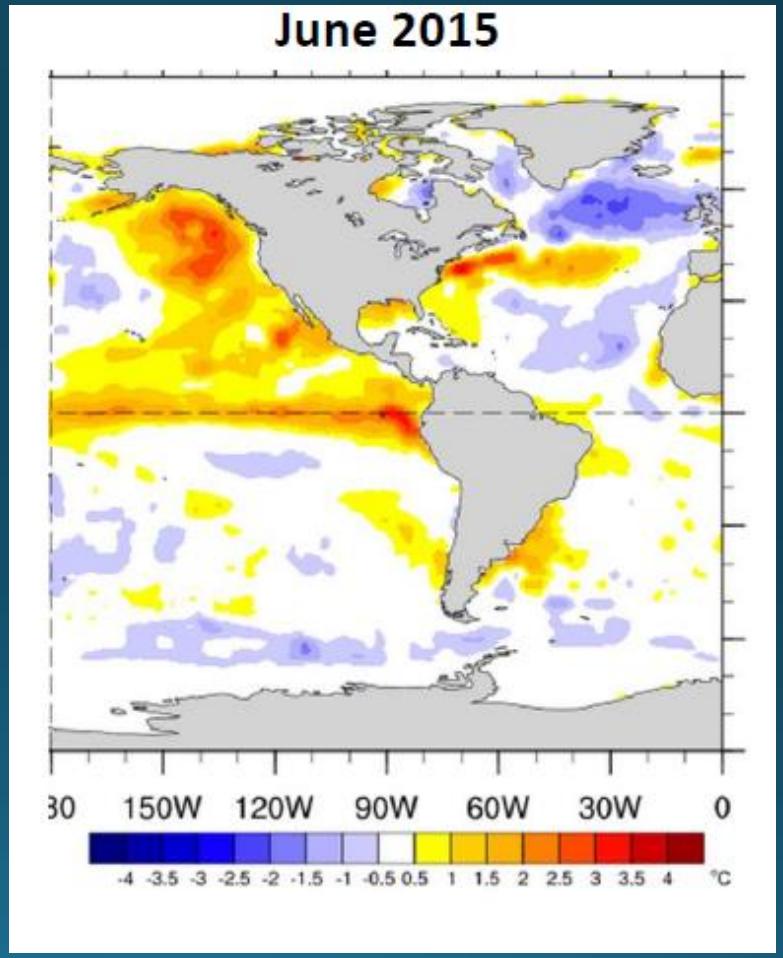


L. Weitkamp NOAA

‘Warm Blob’ Progression

Warm Blob moved inshore in 2015





How does warm water impact salmon?

- High seawater temperatures → altered copepod composition

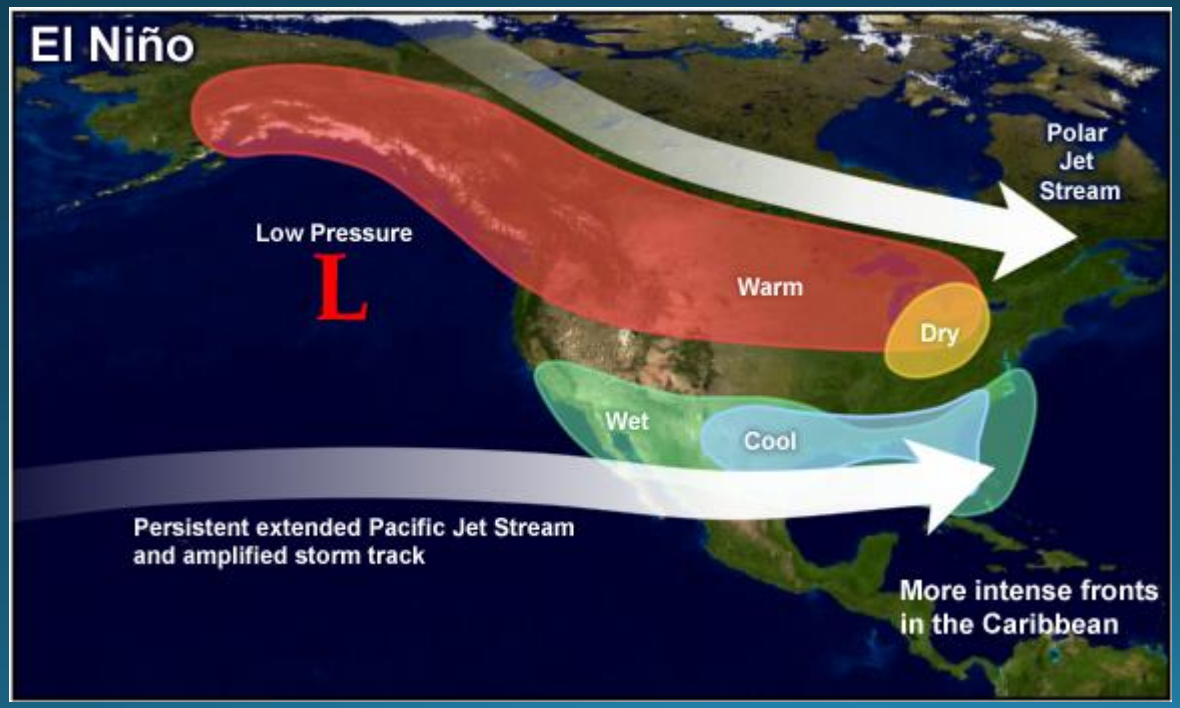
- In warm years - Dominant copepod species are less lipid (fat) rich
  = less productive food web for salmon

Healthy →

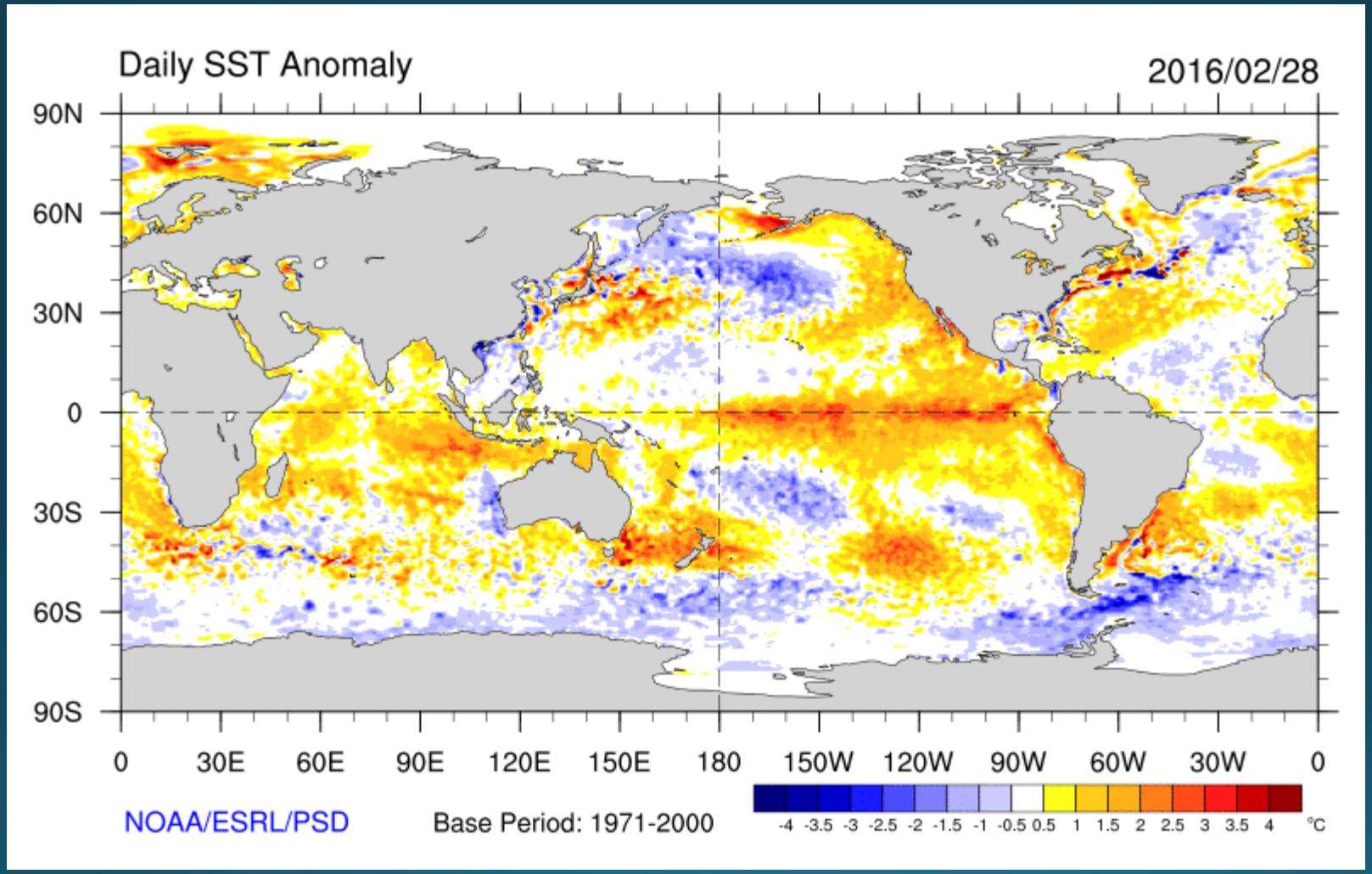
Skinny →

PNW and El Nino

- Shifts jet stream south – storm track toward California
- El Nino effects on Pacific Northwest Weather:
  - Dryer and warmer than average
  - Typically most pronounced after new year
  - 2015/16 November/December above average precipitation
- El Nino expected to dissipate by Summer 2016

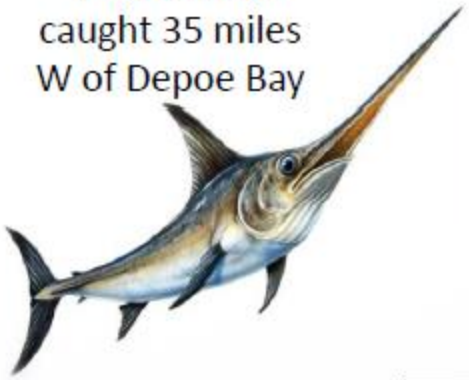


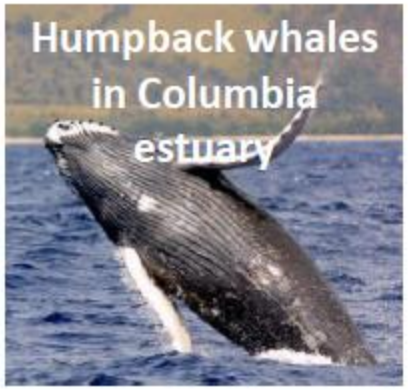
2015/16 El Nino



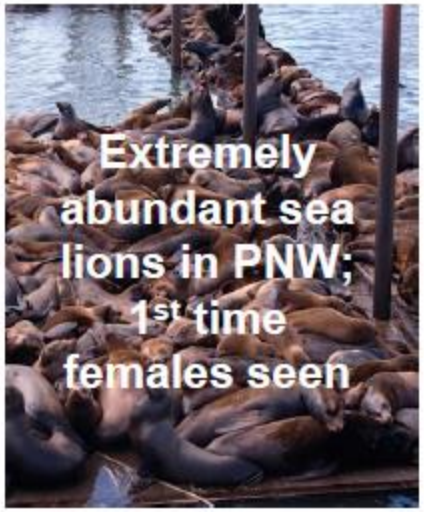
Warm Temps = Unusual Marine Life Sightings

7 swordfish caught 35 miles W of Depoe Bay





Finescale triggerfish off Vancouver Island

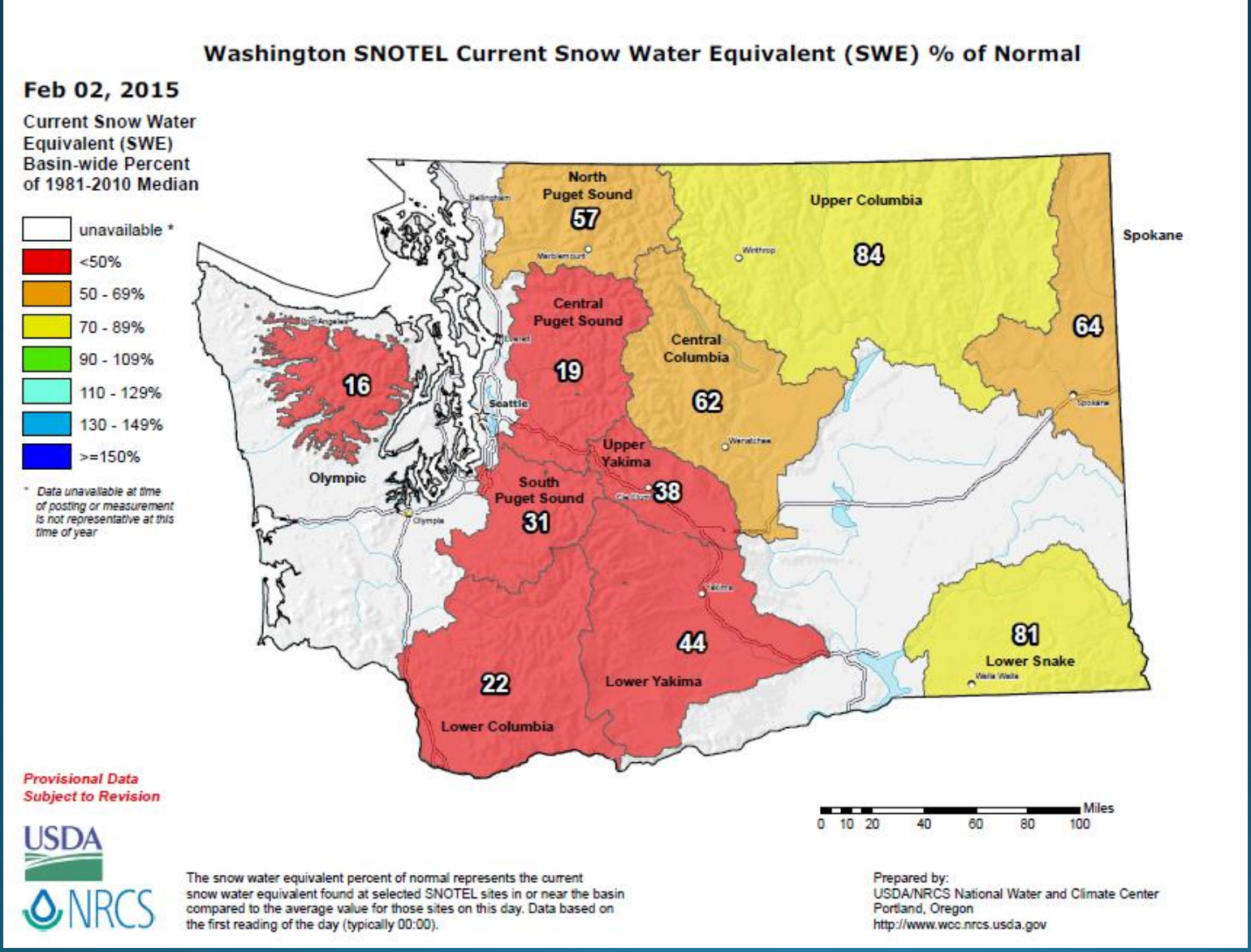


Laurie Weitkamp NOAA

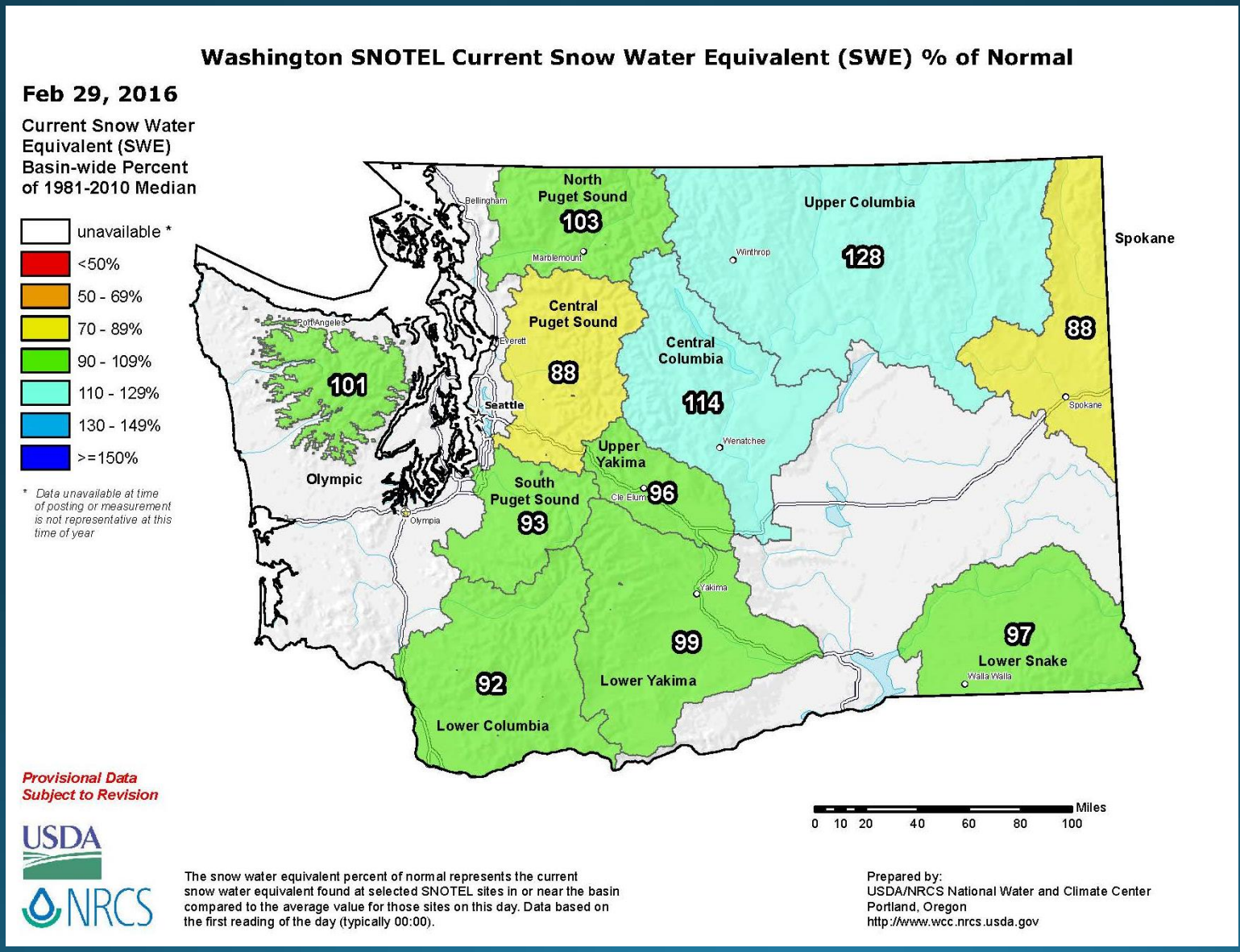
2015 Drought Impacts on Salmon

- Low mountain snowpack
- Reduced river/stream flows
- Warm temperatures
- Low Dissolved Oxygen
- Prespawn mortality
- Example: Columbia R. sockeye in 2015, > 200k fish died en route to spawning grounds

Snowpack – 2014/15



Snowpack – 2015/16



Environmental Outlook Summary

- Forecast for warmer and dryer spring than average
- Anticipated low salmon (especially coho) returns in 2016 due to warm ocean temperatures from the 'Warm Blob' and El Nino
- Drought issues unlikely to be as severe as 2015 because of average snowpack thus far in 2016

Questions?